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TESTING ARCHEOLOGICAL SAMPLING METHODS AT FORT SAN FELIPE 1983

by

Stanley South

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PREFACE

The fourth season of work at the Spanish colonial city of Santa Elena was carried out at Fort San Felipe, in the summer of 1983, through a $35,000 grant from the National Science Foundation. The results of that project are reported in the following pages. The work concentrated on testing archeological methods being used to explore historic sites such as Fort San Felipe, with emphasis on SYMAP display of sampled data as well as of a totally excavated area. Evidence of fortified houses inside the fort was sought and found, as well as three wells, two of which were mentioned in documents of 1572.

The project under which this expedition was carried out is part of a long-range research program into the Spanish presence on the south Atlantic Coast under the direction of Robert L. Stephenson, Director of the Institute of Archeology and Anthropology and State Archeologist at the University of South Carolina. The Principal Investigator for the project was Stanley South.

The excavation and study of a unique city ruin such as that found at Santa Elena requires funding from many sources in order to carry out the years of research necessary to answer the many questions such a resource has to offer. Since the discovery of Fort San Felipe and Santa Elena in 1979, various agencies have contributed to the research carried out thus far, amounting to $308,265. These agencies are: the University of South Carolina, through the Institute of Archeology and Anthropology; the National Geographic Society's Committee for Research and Exploration; the Explorers Club of New York; the National Endowment for the Humanities; the United States Marine Corps; and the National Science Foundation. The National Science Foundation has funded the complete excavation of the inside of Fort San Felipe and three wells found there in 1983. This support of the 1984 research is in the amount of $38,000, with the University of South Carolina providing an additional amount of $31,441.

All projects carried out thus far at the site of Santa Elena and her forts are oriented toward achieving goals relating to site structure, architecture, acculturation, site content, faunal and microfloral analyses, pattern recognition, function, world trade and the Spanish colonial system, status, agricultural practices, documentary research and testing of archeo-

cles and publicity releases have been generated by the various projects. Further dissemination of information from these projects will be seen as continuing research is done on the artifacts recovered in the years to come.

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April 5, 1984

ACKNOWLEDGMENTS

The 1983 project at Ft. San Felipe would not have been possible without the funding provided by the National Science Foundation in the amount of $35,000, with the University of South Carolina's support being $18,716. Also of major importance to the project was the cooperation of the United States Marine Corps personnel, especially Major General James J. McMonagle, Commanding General of the Parris Island Recruit Depot. Also, I want to thank Assistant Chief of Staff Col. David Townsend, Major James Vance, Public Affairs Officer, Major R. F. Holihan, Operations Officer for the Maintenance Department, Sgt. Steve Amos, Sgt. Christine Hawthorne, Gysgt. J. P. Vaivods, and Dr. Steve Wise, Curator of the Parris Island Museum for their cooperation with the Ft. San Felipe project. I also want to thank James Chambers, Jr., for his operation of the sky hook.

I would like to thank Dr. Robert L. Stephenson, Director of the Institute of Archeology and Anthropology for his support as Project Director. Particular thanks go to my assistant Gary Shapiro, who provided excellent field crew direction and analysis help as well as good music and his expertise in the use of his personal Apple II computer to manage the daily gathering of data. Gary's presence made this a most enjoyable season at Santa Elena for all involved.

Special thanks go to John Goldsborough who was my assistant in charge of analysis of the artifacts and the laboratory in the field and at the Institute of Archeology and Anthropology in the analysis phase of the project. Thanks also go to John for his help in the field when his excellent field services were used there for excavating. Thanks too, from all the crew, for the hospitality of John's wife, Joanne, and his mother Elizabeth, for their entertainment of the crew and for their gracious hospitality.

I want to thank my crew members, Mike Harmon, William Hunt, Susan Jackson and Kenneth Sassaman for their excellent field assistance with excavation and note taking. Thanks to Susan Jackson for her profile drawings, and to Ken Sassaman for his computer programming expertise. I want to thank Bill Hunt for his excellent service as official photographer for the expedition and Susan Jackson for her volunteer work in assisting with the analysis of data after the fieldwork was over.

I want to thank Richard Polhemus for his core sampling study made on

Ben Resnick was of considerable help to the project as a house sitter for me while I was in the field and I want to thank him for this and for volunteering his work on the site. Also providing valuable volunteer labor on the site was Greg Smith, who volunteered two weeks of work, Glen Hanson and his wife, Elizabeth, and the Savannah River Plant crew, John White and Harry Doswell, as well as Chester DePratter and his wife, Tricia, and his crew Karen Walker and Greg Paulk. Also I want to thank Linda Sloan for her volunteer help in the field as well as Robert South, Ben Zeigler, Chip Barbot, and Claudia Holland. Thanks too, for Ken Pinson and Jay Hope for help with laboratory work. Thanks too, to Ken for his hospitality in hosting a party for the Ft. San Felipe crew to see them off to the field, and for his editing of the manuscript.

The crew and I want to thank King Oba Oseijeman Adefumi I for his insightful comments on the interpretation of specific features and for sharing with us his knowledge of the Yoruba way on a visit to the crew quarters with his Queen and their daughter.

I want to thank Mrs. Rose Smith and Mrs. Mary Patterson for assistance in providing housing for the crew and office space, laboratory space and for housing for my family during the field phase of the project. Thanks too, to Larry and Lisa Lepionka for providing enjoyable meals for the crew on several occasions, as they have done each season of the Santa Elena project. Their hospitality is appreciated by all.

Thanks to Chris Craft for help with putting the expedition into and out of the field. A special thanks to Mary Joyce Burns for typing the tables and the manuscript on the word processor for this report. I want to thank my colleague Charles Fairbanks for his consultation visit to discuss artifacts and field archeology at Ft. San Felipe. His valuable comments and insights are appreciated.

Acknowledgments for the enjoyment of the Ft. San Felipe field experience would not be complete without mentioning the "Damn Good Chowder," a popular menu item at "The Yankee," a local restaurant in Beaufort, where Pearl Palmer presided over crew meals on many occasions with her unique personality. The crew also has enjoyed many pleasant evenings at "The John Cross Tavern" with Harry Chakadis. Finally, I would like to thank my wife, Linda, for making the field season more enjoyable by quitting her job and joining me for the project.

TESTING ARCHEOLOGICAL SAMPLING METHODS AT FORT SAN FELIPE 1983

Historical Background

Occupation of the area of Port Royal Sound, South Carolina by Spanish colonists at the city of Santa Elena (1566-1587) was a major effort by Spain to gain a foothold in the New World. The significance of this capital city of Spanish Florida has been outlined by historians (Connor 1925; Hoffman 1978; Lyon 1976; Ross 1925; Salley 1925), but generally the importance of this chapter in America's colonial history has been overlooked or ignored in favor of the story of later English settlement. In the 1560s the population at Santa Elena numbered more than 400. It was a major step by Spain toward curbing the French exploration and settlement which had begun in the Port Royal area in 1562.

Archeologically Santa Elena offers a primary research opportunity in that beneath the plowed soil zone of Parris Island's surface is a sealed Spanish occupation zone where objects dropped by Spanish occupants and their Indian friends and servants remain untouched near and in the forts which once guarded the settlement as well as in the city itself. These forts and the city of Santa Elena, which had over 60 houses in 1580 (Connor 1930: 283), were abandoned in 1587 after Sir Francis Drake burned St. Augustine, bringing to a close the 21-year period of Spanish presence at Santa Elena (Hoffman 1978; also Connor 1925; Lyon 1976; Ross 1925; and Salley 1925). The nature of the archeological and documentary record allows a unique opportunity to test archeological methods in a manner not often seen on sites of the prehistoric period. This project is designed to take advantage of this opportunity.

The first fort built at the Spanish colonial settlement of Santa Elena, when the city was established in 1566, was named San Salvador (Lyon 1984: 3). By October 1569, 40 houses stood in Santa Elena and 327 persons were living in the town and fort (Lyon 1984: 7). Shortly after Ft. San Salvador was built the Spanish infantry stationed there mutinied, seized a supply vessel, and fled to Cuba. Reinforcements arrived with Juan Pardo and a 250-man company (Lyon 1984: 4). They built a new fort they called Ft. San Felipe, the first of two forts to carry the name at Santa Elena.

A fire in 1570, in the fort, resulted in a new San Felipe being built, beginning with the construction of two casas fuertes (fortified houses) large enough to house the entire population of Santa Elena. These were completed by February 1572 (Hoffman 1978: 23; Lyon 1984: 15). These fortified houses very likely were surrounded by a protective palisade. It was not until 1574, however, that the new Ft. San Felipe was surrounded by a moat (Hoffman 1978: 23). This fort now had two strong houses, a moat, drawbridge, and two wells, designed primarily to withstand a possible siege by French corsairs (Lyon 1984: 15).

Santa Elena was sacked and burned by Indians, along with Ft. San Felipe, in 1576, bringing to an end the brief four-year period of its existence (Lyon 1984: 21; Hoffman 1978: 25). It is this fort that was found through a sampling survey in 1979 (South 1979), and that is the subject of this report. The Spaniards returned, however, in 1577, bringing with them timbers for building a new fort, Ft. San Marcos, some 200 yards south of Ft. San Felipe, on lower ground to allow a water-filled moat providing additional protection not seen at Ft. San Felipe (Hoffman 1978). The relationship between Ft. San Felipe and Ft. San Marcos at Santa Elena is seen in Figure 1.

Project Background

As a result of the discovery of Ft. San Felipe (1572-1576) at Santa Elena in 1979 (South 1979), a profile section 10 feet wide was excavated through the west curtain of the moat in a National Geographic Society-sponsored project (South 1980). This project demonstrated that the moat at the west curtain measured 15 feet wide by 5 feet in depth. It contained a variety of Spanish and Indian artifacts from the period of the sixteenth century. From their location in the moat of a fort known to have been dug in 1574 and destroyed by Indians in 1576, these objects could be dated to within a short time period, similar to objects found on a shipwreck. The outline of the moat of Ft. San Felipe is seen in Figure 2.

From this information on the fort measuring 200 feet from outer bastion moat points and containing 460 linear feet of moat fill, it became obvious that to totally excavate the fort at any one time would require a project of tremendous funding. It was decided that the excavation of one bastion at a time, of the two remaining bastions, would be an excellent means of arriving at an understanding of the archeological data the fort contained. The National Endowment for the Humanities agreed to fund a $40,000 project during the summer of 1982, with analysis and writing to extend into the early months of 1983. A $35,000 grant from the National Science Foundation allowed a sampling survey and partial excavation of the interior of Ft. San Felipe to be carried out during the 1983 excavation period. This work is the subject of this report.

Seven previous projects have been carried out at Santa Elena between 1979 and 1983, funded by the University of South Carolina, the National Geographic Society's Committee for Research and Exploration, the Explorers Club of New York, the United States Marine Corps, and the National Endowment for the Humanities. The results of these projects are reported elsewhere (South 1979, 1980, 1982, 1983).

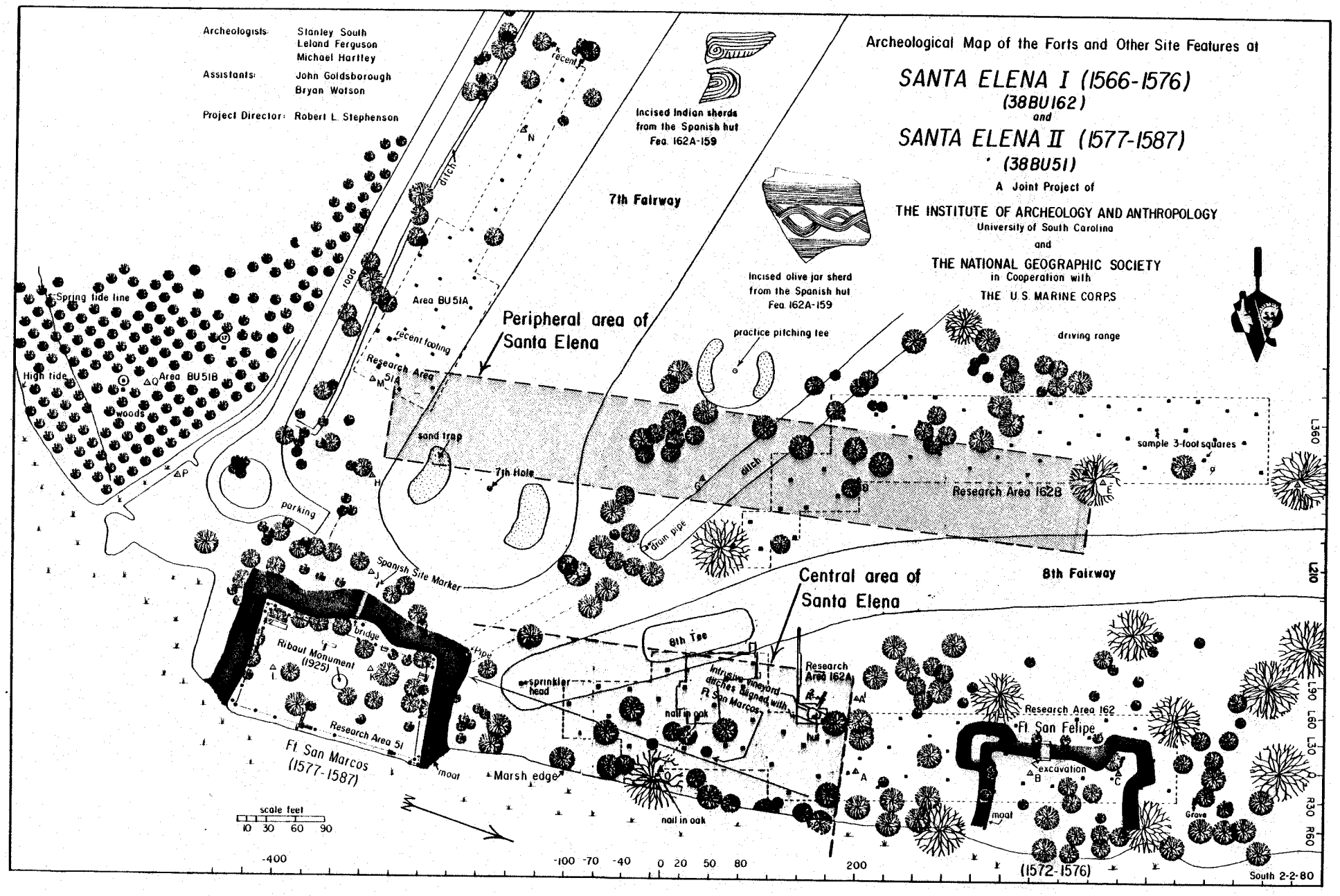


Figure 1. Archeological map of the forts and other site features at Santa Elena.

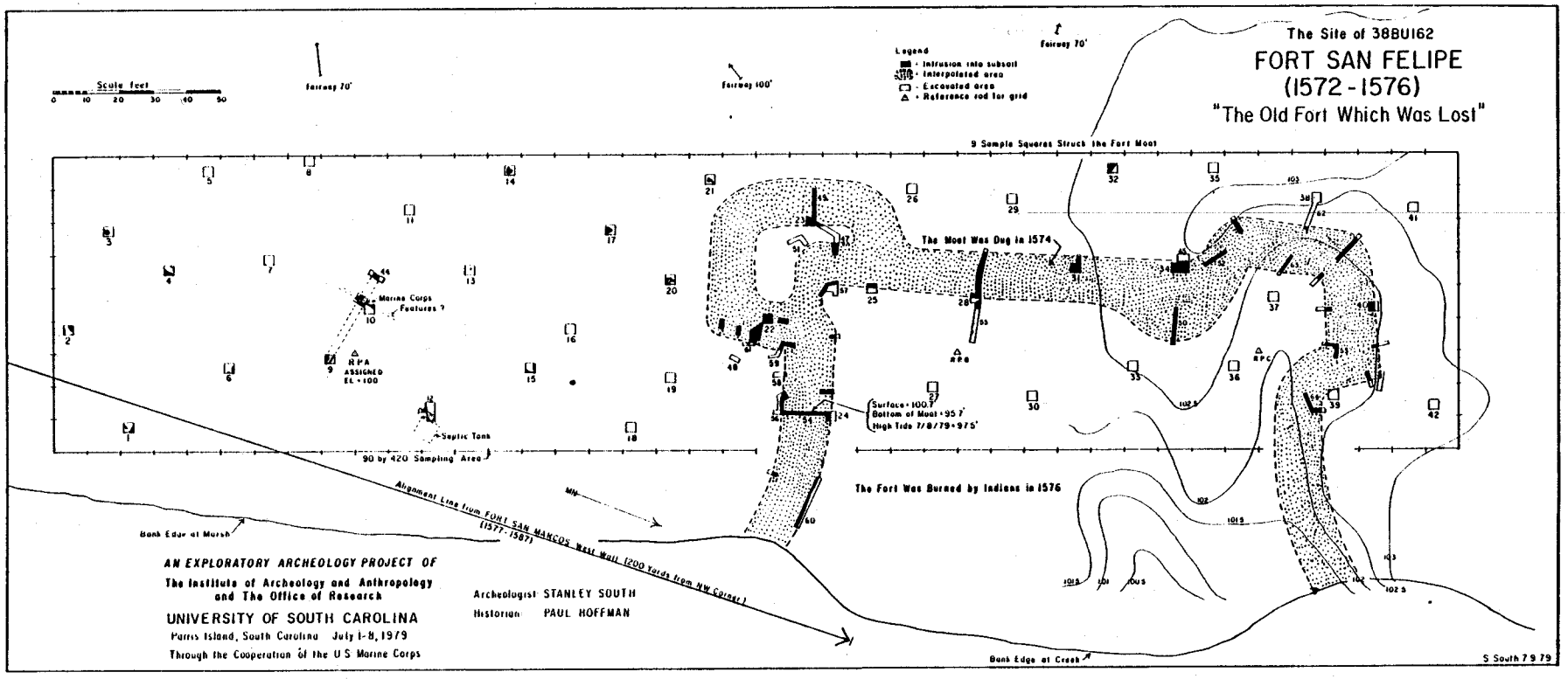


Figure 2. The outline of Fort San Felipe as determined by sample squares and slot trenches in 1979.

RESEARCH GOALS AND STRATEGY

Architectural Goals

An architecturally oriented goal of interest inside Ft. San Felipe is the discovery of evidence of the two casas fuertes documented to have been constructed in 1572 (Hoffman 1978: 23; Lyon 1984: 15), around which the moat of the fort was dug in 1574. Two wells were also known to have been inside the fort and the location of these was also of considerable interest.

Sampling Goals

A major goal of the 1983 National Science Foundation project inside Ft. San Felipe, however, was the testing of archeological sampling methods being used to draw inferences about the archeological universe on a site. Previous sampling schemes at Santa Elena had employed a 1% sample to discover the location of areas of greatest artifact density to pinpoint the location of Santa Elena (South 1979, 1980, 1982, 1983). The predictive value of the 1% sample has been excellent in locating Spanish artifact concentrations. When several artifact classes from a sample square are used, the location of individual houses can be predicted with a high degree of reliability.

The success of the 1% stratified systematic unaligned subsurface sample in predicting the location of Spanish structures in the city of Santa Elena has been remarkable. When three of the five attributes--fired daub, Spanish pottery, fire-hardened floors, iron nails and spikes and posthole features--are present in a sample square, the presence of an architectural structure has been found to be 100% predictable thus far. The goal of the 1983 method testing project was to use the methodologically sound strategy used thus far at Santa Elena of stratified systematic unaligned subsurface sampling inside the area of Ft. San Felipe to discover the position of the two casas fuertes or strong houses around which the palisade was built in 1572 and the moat dug in 1574. However, instead of the 1% sample used throughout the site of Santa Elena as a discovery tool for artifact density and architectural data, a 3% sample was planned.

At St. Mary's City, Maryland, Garry Stone has looked at data from totally excavated seventeenth century areas to determine the sampling level necessary to answer the questions he is asking of sample data. He has found that a 7% sample is more effective in his situation (Garry Stone, personal communication). The 3% sample increases by threefold the sample data we have been getting and is thought to be necessary to predict more sensitively the location of the structures within the more confined space inside the area of the fort. This space is 90 by 120 feet (Fig. 3). It was thought that 36 sample squares (3%) inside the area of the fort would allow a relatively close pinpointing of the location of the two structures known to have been there.

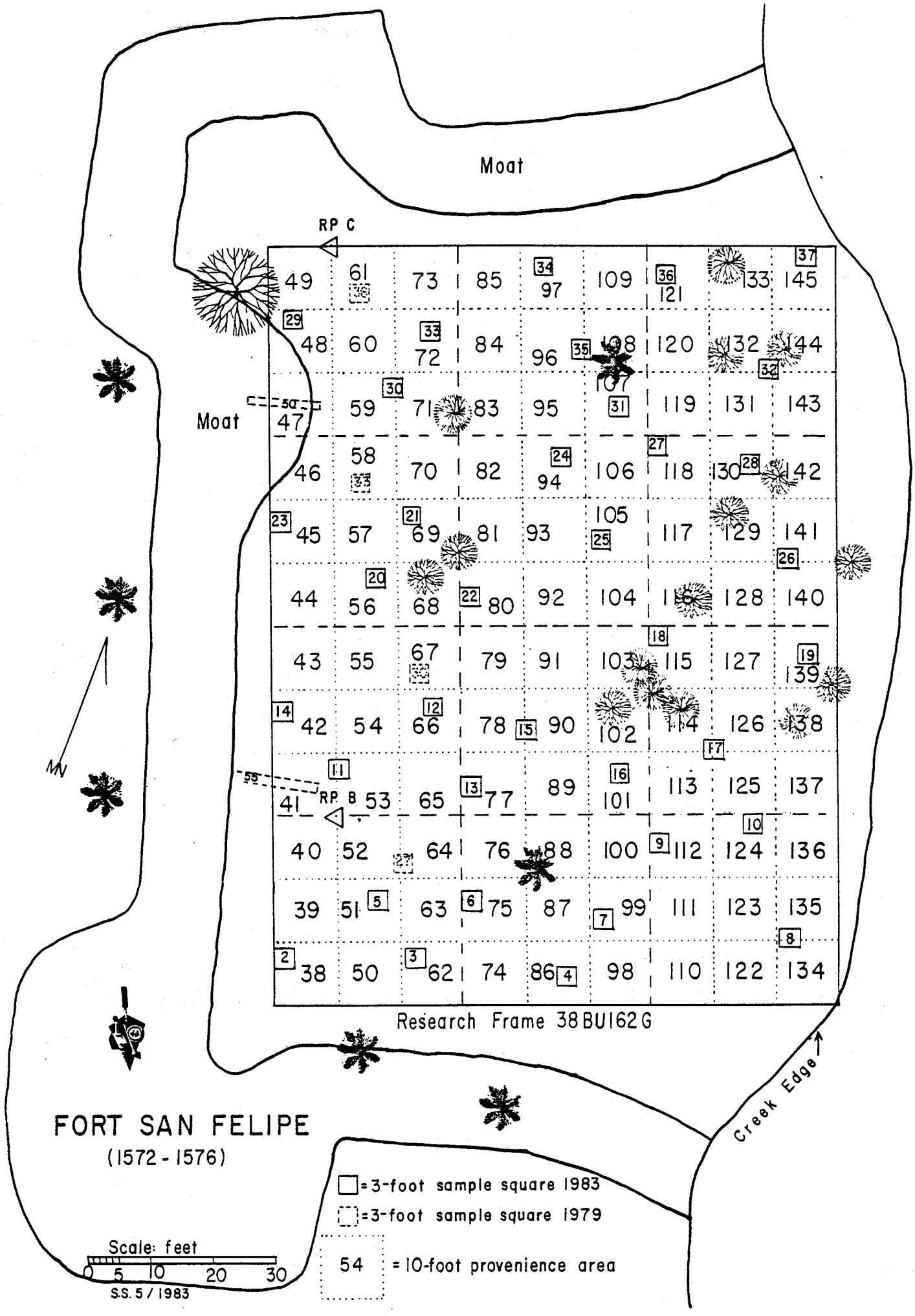


Figure 3. Research frame 38BU162G at Fort San Felipe.

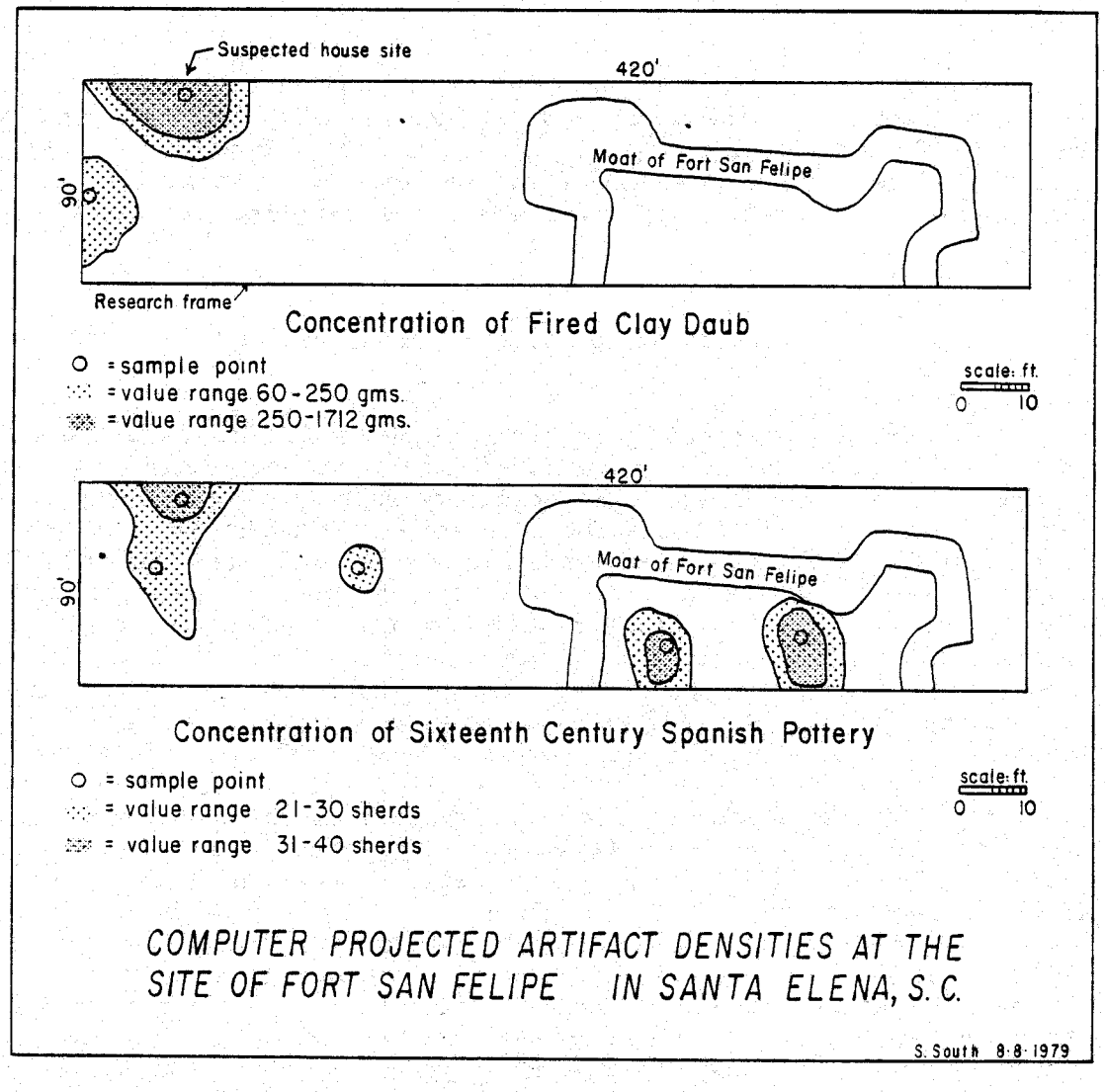


Figure 4. A. Concentration of fired clay daub predicted from sample squares.
B. Concentration of sixteenth-century Spanish pottery predicted from sample squares.

SYMAP display of artifact classes, particularly Spanish pottery, Indian pottery, and fired-clay daub, were expected to reveal the relationship between artifact density and architectural data as spelled out in South's Brunswick Pattern of Refuse Disposal (South 1977: 47). The 1% sample inside the fort revealed two clusters of sixteenth-century Spanish pottery (Fig. 4B), possibly the area of the two structures known to have been inside the fort. A 3% sample frame inside the fort should pinpoint more directly the refuse clusters associated with the architectural remains.

The purpose of the above procedure is to explore the degree to which a 3% is reflective of the architectural data as well as the artifact data resulting from the Spanish occupation of the fort from 1572 to 1576, compared with the total excavation of the sampled area. To do this an area 30 by 120 feet was totally excavated after the sampling procedure was completed.

The Carolina Pattern Comparison Goal

Of more general interest, however, is the question of the relationship between the archeological record found inside the fort compared with that in the town of Santa Elena. The documents suggest that soldiers were billeted in the town and the hut found in 1979 is thought to possibly be the kind of quarters where a single soldier may have resided (South 1980). To what extent was the domestic life of military personnel carried out inside the fort? Deposits of refuse from meals inside the fort would indicate that certainly not all subsistence activity took place in town, regardless of what the documents state. The Carolina Pattern model of artifact comparison was designed to address such questions using a classification system related to major functional criteria (South 1977).

Using this analysis tool, the artifacts from the northwest bastion of the moat were compared with those from the domestic area of Santa Elena (South 1983). The Kitchen Group artifacts represented 15.2% compared with 80.4% Indian pottery. This is close to the 20.7% (Kitchen) and 77.9% Indian pottery from the 1979 ten-foot wide trench through the west curtain wall of the fort moat (South 1980: 69) A similar relationship is seen in the A and B zones above the northwest bastion of the fort where Spanish-introduced pottery represented 19.9%, with Indian pottery being 80.1% (South 1983). The closeness of these figures suggests that the pattern we are seeing is a general one at Ft. San Felipe and not simply limited to the northwest bastion area. Our expectations were that a similar pattern might well be found inside the area of the fort.

This 80% Indian and 20% Spanish pottery might be thought of as a "Military Pattern," compared with the "Domestic Santa Elena Pattern" of 55% Spanish pottery to 45% Indian pottery, a more evenly matched relationship (South 1983). Testing which of these patterns prevails inside the occupation area of Ft. San Felipe was a goal of this project.

Military vs. Domestic Function Goal

Using the Carolina Pattern analysis model, comparison of arms group artifacts such as musket balls, cannonballs, armor, etc., from the fort and Santa Elena can be made. From the B zone in Santa Elena, the Arms Group artifacts represent 5.0%, with that from the features being 4.6%, for an average of 4.8%. From Ft. San Felipe's northwest bastion moat, it was 4.3% (South 1983). This comparable relationship between the town and fort in relation to the ratio of arms artifacts in the archeological record is not what we expected. We expected a higher percentage of arms artifacts at the fort. Whether this similarity would hold inside the fort was of interest in this project in relation to monitoring domestic vs. military occupations, and the degree to which the military and civilian occupations were integrated as far as behavioral by-products are concerned.

Spanish and Indian Interaction Via Pottery Goals

St. Johns Plain pottery and St. Johns Check Stamped pottery was made by Timucua Indians along the St. Johns River near St. Augustine, Florida (Goggin 1947: 114; Deagan 1978). It is an easily identified ware with a black center and white surface and a chalky paste. The 1979 sampling survey produced no St. Johns pottery at the site of Ft. San Felipe. It was found in the area of the city of Santa Elena, however (South 1979, 1980; Fig. 5). The cross-section cut through the west moat of Ft. San Felipe revealed no St. Johns pottery (South 1980: 69). The A and B zones above the northwest bastion of Ft. San Felipe also revealed no St. Johns pottery. With these data contrasting the area of the town with Ft. San Felipe in relation to St. Johns pottery, its relative presence in the moat at the northwest bastion of Ft. San Felipe was of considerable interest. Only 12 sherds were found in the moat.

What this means is that St. Johns pottery was not absent from use in Ft. San Felipe, but it was dramatically less present there than it was in the households in Santa Elena. This suggests that there was a far greater interaction between civilians in Santa Elena with Florida Indians around St. Augustine than was the case with the military personnel at Santa Elena. This may have been in the form of Florida Indians being used as servants or mates in Santa Elena households, or that St. Johns vessels were used to transport goods into Santa Elena households whereas the military did not resort to this type vessel for transporting their goods to the settlement. A temporal explanation could lie in the fact that Ft. San Felipe is earlier than the area of Santa Elena we have examined, as suggested in 1980 (South 1980: 64).

It is interesting to note that whereas the military personnel at Ft. San Felipe were using locally made Indian pottery to a far greater extent than were the citizens of Santa Elena in relation to Spanish goods, this did not hold true for the use of St. Johns pottery, but rather, the reverse was the case. Addressing this question with new data from inside Ft. San Felipe was one of the goals of the 1983 project, i.e., the Spanish/Indian/

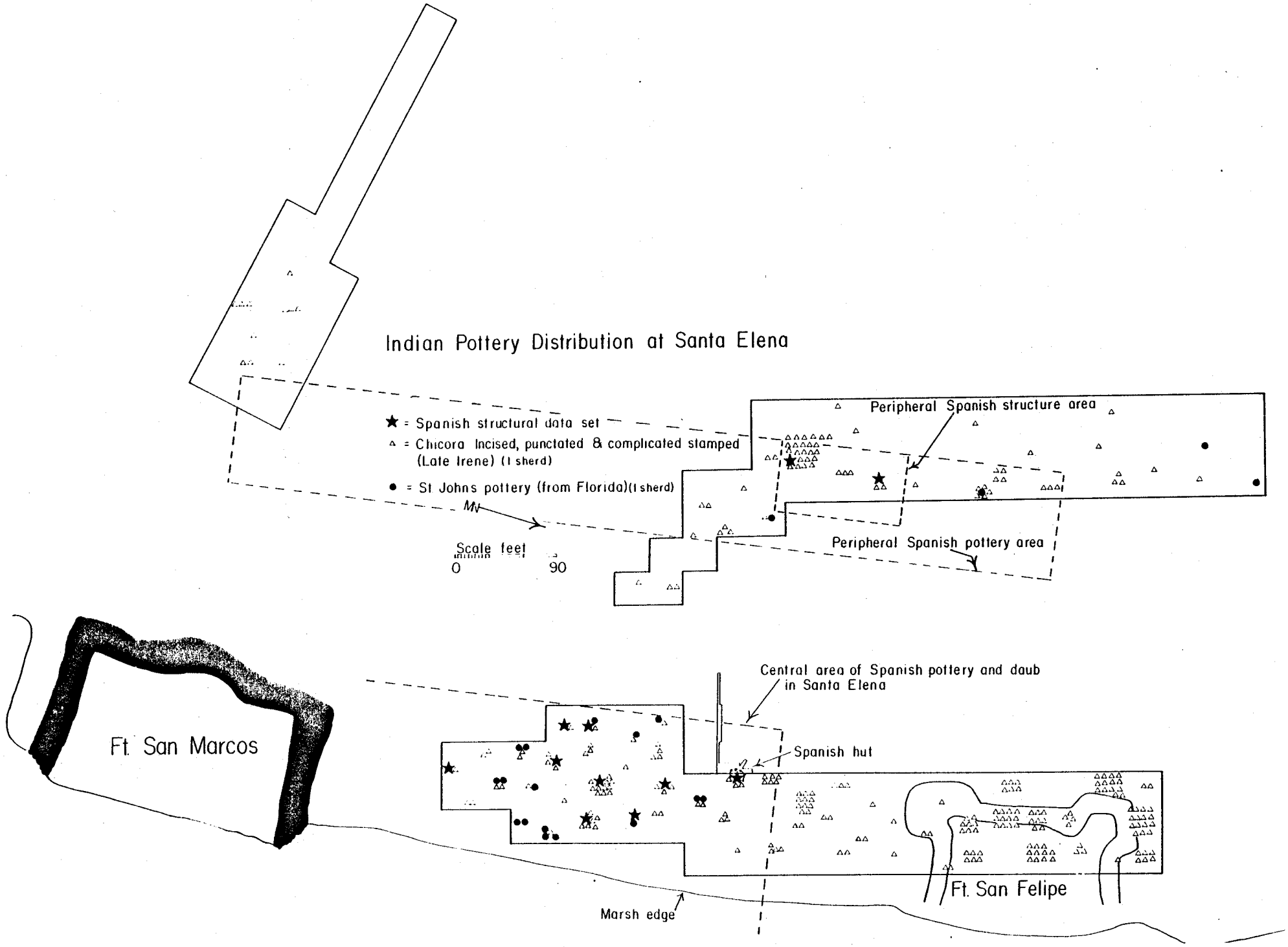


Figure 5. Distribution of St. Johns pottery in Santa Elena and Fort San Felipe.

Military/Civilian interaction as revealed in the bits and pieces the occupants left behind.

The Military vs. Civilian Diet Goal

Most of the faunal/floral analyses of data have been carried out on remains recovered from the domestic refuse of the city of Santa Elena (South 1980, 1982, 1983). It is expected that few refuse features will be found inside the area of Ft. San Felipe, these perhaps, being limited to refuse-filled daub-processing pits dug during the construction of the two casas fuertes, or fortified structures built inside the fort palisade. However, it will be interesting to compare the diet of the soldiers inside Ft. San Felipe with that from the domestic occupation area of Ft. San Felipe. This is one of the goals of this season's project, provided features containing such military connected faunal remains are located inside the fort.

RESEARCH METHODS

Three-foot Square Sampling

Thirty-six squares, laid out within a 90 by 120 foot area inside Ft. San Felipe, were chosen using a 3% stratified systematic unaligned subsurface sample procedure (Fig. 3). This area inside the fort has been designated as sample frame 38BU162G. Provenience 1 is used for all out-of-context data, with numbers 2 through 37 being used for the 36 sample three-foot squares (Berry and Baker 1968). As sample squares were selected some were found to fall where trees were located and in these cases the square was moved to clear the area of the tree (Fig. 3). Within the research frame 108 ten-foot squares were laid out and provenience numbers assigned from 38 through 145. A north-south strip of these 30 by 120 feet was excavated after the 3% sample was excavated to determine the relationship between the sample prediction of artifact density and the archeological layers within the 10-foot squares (Fig. 3).

Four sample squares were taken during the 1979 season when sample frame 38BU162 was excavated. These squares are shown in Figure 3 as dotted squares numbered (BU162-27, 30, 33 and 36). Exploratory slots 50 and 55 were also excavated at that time and are shown on the left edge of the research frame in Figure 3.

After the position of each square was determined from a table of random numbers (Hoel 1966: 326-327), angles and distances from iron pipe reference point B (Fig. 3), were used to set wire-stemmed flags with the provenience number for the sample square. These flags were set at the southeast corner of each sample square. A transit was used to lay out the grid within which the sample squares were positioned and a three-foot plywood square was used to quickly position the corner nails for the square.

The topsoil zone has been found to be about .9 feet in depth. This is the A zone. Beneath this there is sometimes an undisturbed B zone representing the Spanish midden bearing layer (South 1980; 1982; 1983). Inside the fort, however, it was found that considerable Marine Corps activity had removed much of the topsoil zone, leaving virtually no undisturbed B zone between it and the subsoil level.

As excavation of the three-foot sample squares proceeded, it was found that squares 8, 10, 17, 26, and 28, were disturbed to a depth of three feet or more by recent, twentieth-century Marine Corps filling activity designed to stabilize the eroding bank of the creek in this area of the site. These squares all lay along the eastern edge of the site, clearly revealing the location of an earlier edge of the eroded creek bank (Fig. 6). For this reason, therefore, squares 19, 32, and 37 were not dug. This discovery revealed that not as much of the fort survived as had previously been thought, so that instead of 90 feet remaining inside the fort to be excavated (Fig. 3), only 60 feet remained (Fig. 6). For this reason the SYMAP data reflected an area 60 by 120 feet in size.

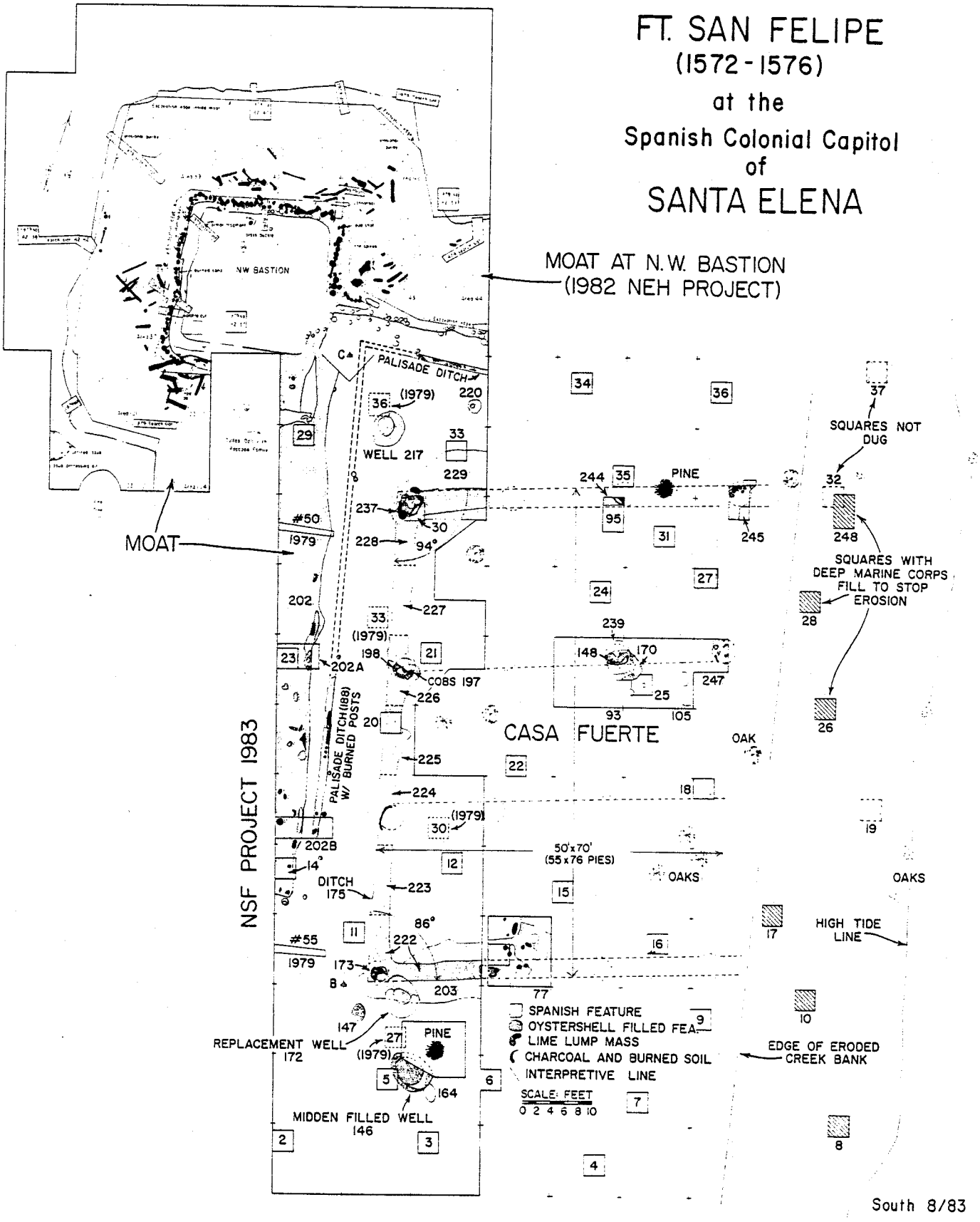


Figure 6. Excavated areas of Fort San Felipe at Santa Elena.

Architecture Discovery Trenches

In sample square 25, at the northwest corner, a feature was found in which a small fragment of Spanish armor was seen. In the anticipation of a larger fragment of armor an area 20 by 30 feet was opened in this area so that the entire outline of the feature could be seen and the pit excavated. This feature cluster (Feas. 148, 170, 239) turned out not to have further armor fragments but did prove to be a major posthole feature for the casa fuerte (Fig. 6). As this discovery was made it became of interest to see if other casa fuerte postholes could be located, so several architecture discovery trenches were excavated with this goal in mind (Feas. 95, 245, 247, 248). This procedure allowed the entire area of a 50 by 70 foot casa fuerte to be revealed.

Core Sampling

Before excavation of the 30 by 120 foot area inside Ft. San Felipe was begun, Richard Polhemus carried out a core sampling study of the area to determine the degree to which a one-inch core could be used to predict subsurface features. No formal report on this study has been written, but two major features were revealed by this method of sampling. One of these was the moat (Fea. 202) along the west edge of the 30 by 120 foot area (Fig. 6), and the other was the large Marine Corps ditch (Fea. 154) at the south end of the research frame (Fig. 7). The study suggested that at the 10-foot sample interval used, only major ditches such as the moat and large Marine Corp features could be reliably determined by this sampling method.

Ten-Foot Square Excavation

After the three-foot sample frame had been excavated the westernmost 30 by 120 foot area inside the fort was excavated to reveal the features intruding into the subsoil at the bottom of the topsoil zone (Fig. 3). It was thought that this would reveal archeological evidence of the architectural remains of the casa fuerte known to have been inside the fort. This was found to be the case when a 70-foot long ditch was discovered within the area.

As each 30-foot square area was revealed to the subsoil level, after the overlying topsoil zone was removed and sifted through 1/4-inch mesh screen, photographs were taken and the features transit-plotted. Processing of the sample square data and that from the 10-foot squares was carried out along with the fieldwork to allow the SYMAP analysis of the artifacts to be available as soon as possible after the fieldwork was completed (Dudnick 1971).

As each 30 by 30 foot area was transit-plotted, the features were drawn onto a master map of the site area. The master map drawn in the NEH project in 1982 was attached to this map so that the relationship of these data from the two seasons could be seen. All features, whether Spanish

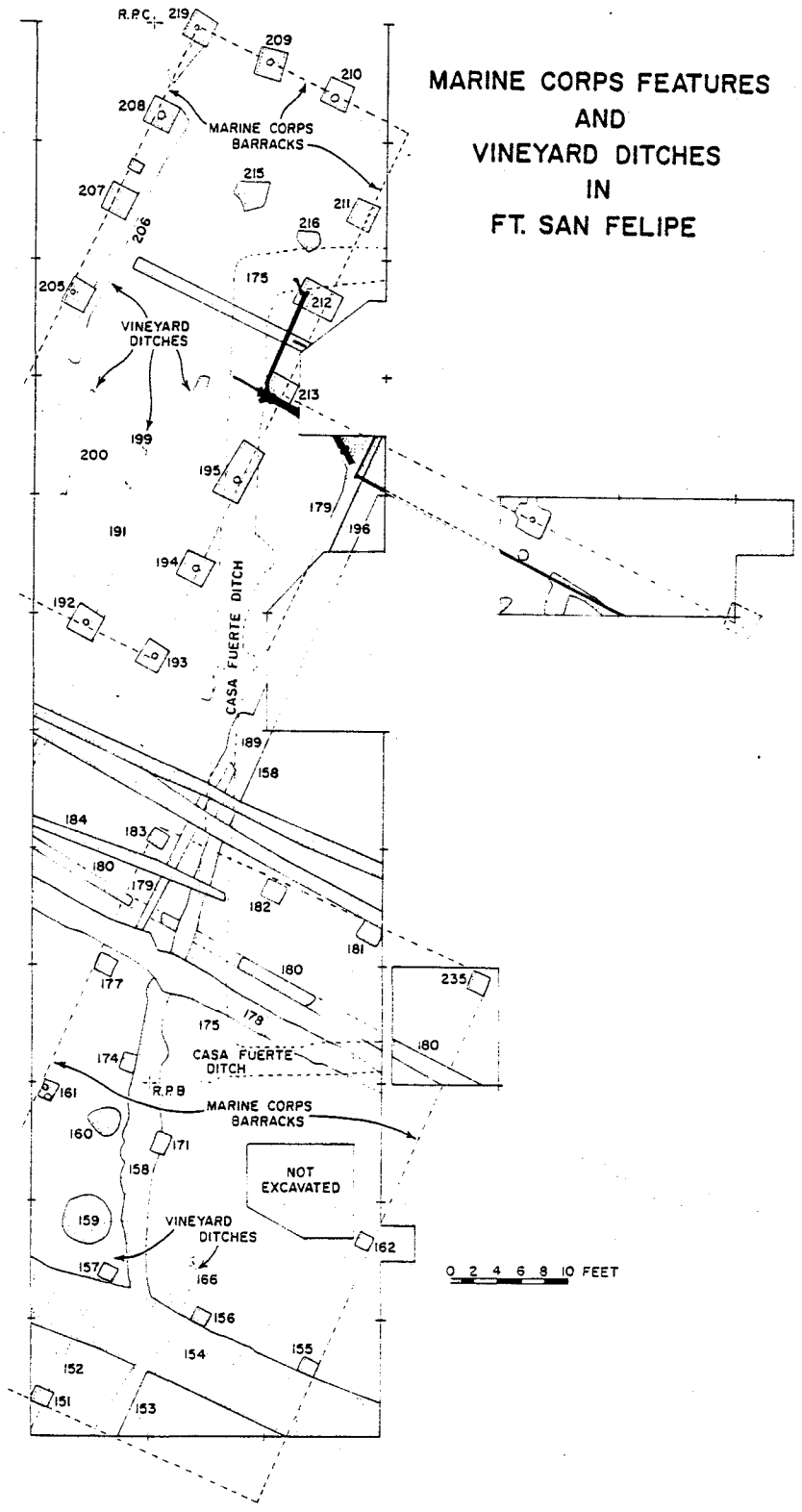


Figure 7. Marine Corps features and vineyard ditches at Fort San Felipe.

pits and ditches, post-fort vineyard ditches, or Marine Corps ditches and pits, were plotted onto the master map. Since the fill soil of the Marine Corps' features was much lighter than any Spanish features, and thus easy to distinguish from Spanish features, two maps have been prepared to illustrate these data. The Spanish features are shown in Figure 6, and the Marine Corps' features are shown in Figure 7.

Spanish Feature Excavation

As each feature was revealed at the subsoil level below the topsoil zone, feature numbers were assigned and observations made as to whether the feature was likely of the Spanish period or from a later time. These data are shown in Figures 6 and 7. The edge of the west curtain moat was seen along the west side of the excavated 30 by 120 foot area, with a palisade ditch paralleling it (Fig. 6). The casa fuerte ditch 70 feet long was seen at the east edge of the excavated area and this was designated as Feature 175. When the ditch was excavated provenience numbers 222 through 229 were assigned for various sections of the ditch (Fig. 6). The moat was not excavated and was assigned the single number 202. Two profile sections were cut into the moat and these were designated as 202A and 202B.

Three areas within the casa fuerte ditch contained midden concentration and were found to be posthole areas within the ditch 175. These were designated as 173, 198 and 237, and will be discussed in detail in a later section, along with features 148, 170 and 239, which were also parts of a casa fuerte posthole (Fig. 6).

Three features were characterized by having a lighter outer ring of fill from white sand underlying the top several feet of the site, suggesting these were deeper holes backfilled around the edge with white sand brought up from deep within the site. Such an outer ring was seen in the well excavated in the 1981 season and these three features are thought to also be wells. They are Features 146, 172, and 217 (Fig. 6). Feature 172 intrudes onto the casa fuerte ditch, postdating that feature, and is thought to be a replacement well for Feature 146, which is filled with oystershell midden. Each well was dug to a depth of two or more feet to obtain a sample and to verify that a deep feature was involved. All soil from Spanish features was water-screened through 1/8-inch screen, with soil samples being taken for flotation for faunal and plant analyses.

Marine Corps and Vineyard Ditches

As cleaning of the subsoil level beneath the topsoil zone was carried out, the most dramatic feature seen were Marine Corps' ditches and barracks footing holes from the period of World War I (Figs. 7, 8, 9). The footing holes appeared to form two structures 20 by 50 feet and 30 by 50 feet in size (Fig. 7). The northernmost structure had cast iron plumbing in the ditches. We have called these remains "barracks"; however, they may have been latrines, since a map drawn in June 1918 to show an extension to Marine barracks and a plot plan of the maneuver ground shows barracks as

Figure 8. Marine Corps ditches in the central area of the 30 by 120 foot area, looking toward the northeast.

Figure 9. The south end of the 30 by 120 foot area, looking toward the northwest, with ditch #154 in the foreground.

being 20 by 90 feet in size, mess halls as 20 by 160 feet, and latrines as 20 by 50 feet in size (Rogers 1918).

The shallowness of the topsoil zone in places over the Ft. San Felipe site and the deeper deposits near large trees, and the virtual absence of a "B Zone" inside the fort, all reveal the fact that the area was heavily disturbed during the activity on the site during the First World War. More recently, in the 1940s, according to Grounds Superintendent, Woodrow Garvin, the fill soil was pushed over the edge of the bank along the creek about that time, and this came from the site itself. This activity removed some of the topsoil zone from the site. None of the Marine Corps features were excavated.

Several characteristic vineyard ditches, seen on the site during all excavations carried out so far (South 1979, 1980, 1982, 1983) were found intruding onto the Spanish features and intruded by the Marine Corps features. Some of the ditches of this type have been found to have been intruded on by Spanish features (South 1983: 12,14), suggesting their use during the second period of Santa Elena, from 1577 to 1587. One ditch at the northwest bastion, however, contained a brick bat characteristic of the nineteenth-century period, so some may date from that period (South 1983: 60). None of the vineyard ditches were excavated in this project. The few ditches of this type are seen in Figure 7.

OBSERVATION AND INTERPRETATION

Documentation - Architecture

Fort San Felipe Had Large Wooden Strong Houses (casas fuertes)

A study of the wooden forts at St. Augustine, carried out by Paul Hoffman, reveals that Ft. San Felipe was probably a twin to that in St. Augustine (Hoffman 1973: 5). A reference of 1586 mentions the use of vertical palisade logs of pine at St. Augustine and evidence discovered at the northwest bastion at Ft. San Felipe reveals that it, too, had a palisade along the outer wall just inside the moat (South 1983: 54).

Hoffman states that prior to 1585, the Spanish strategy was to build fortifications as much to protect against Indians as against European style warfare, with flight into the woods an an alternative if the fort failed (Hoffman 1973: 2). He points out that the wooden Spanish forts "were essentially very large wooden houses which served to house the garrison and its food, to protect the troops while they assembled in preparation for sallying against the attacking enemy, and as a last resort, as a strong hold able to stand off attack by Indians and small bands of Europeans who arrived without field artillery and whose ships could be kept at bay outside of the bar of the port by the fort's heavy artillery (Hoffman 1973: 2). We might expect Ft. San Felipe to be such a large wooden fortified house.

The casa, or house, at St. Augustine was a two-story building with a gun platform on the side. It was laid out in 16 squares or 19 pies (approximately 11 inches to the pie) on the side, measuring 3 squares by 4 squares forming an L-shaped space 52.2 by 69.6 feet in size. The construction method was post-and-beam, with the walls of sawn, pine lumber, held together by iron nails, spikes, hinges, locks, etc. (Hoffman 1973: 9a, 9b). Ft. San Felipe was likely constructed in a similar manner.

In 1978, Hoffman conducted a study of the fortifications at Santa Elena and a summary of data relating to what Hoffman refers to as Fort San Felipe II, (1572-1576), is presented in the following paragraphs.

After the fire of 1570 (Eugene Lyon 1984, says 1571), two "strong houses" (casas fuertes) were completed by 1572. A moat was dug around the fort, called San Felipe, in 1574, and two wells were dug inside the walls. Repairs were made during the Indian attack on the fort in 1576. The fort was burned by the Indians as the Spanish abandoned Santa Elena and the fort. There were four pieces of mounted bronze artillery pieces in the fort (Hoffman 1978: 23).

When the first Ft. San Felipe burned in 1570, ". . . then Pedro Menéndez ordered the said strong hold (casa fuerte) built in the center of the city with great (gap in text, "timbers?") of pine, which had a moat around

it and its drawbridge." It was said to be a large fort that could hold everyone, even 500 or more (Hoffman 1978: 24; Archivo General de Indias [AGI] Escribania de Camara 1024, A, piece 16, fol. 5; citation courtesy of Dr. Eugene Lyon).

In a declaration of 1577, Bartolome Martinez said that Ft. San Felipe's walls were "of wood, faggots, and earth," and Inigo Ruiz de Castresana states that they were built "of wood because there is neither stone nor lime nor other materials" and their ramparts are of faggots and earth (Hoffman 1978: 25).

Fort San Felipe Had Neither Stone Nor Lime

From these data we see that the two casas fuertes or strong houses were built with large timbers of pine with a moat around them. Witnesses said the fort was built "of wood, faggots, and earth," and that it was built of wood "because there is neither stone nor lime or other materials." and "their ramparts are of faggots and earth" (Hoffman 1978: 25).

It is important to note that specific mention was made of the absence of the use of lime or stone in the construction. This reveals that by 1576, when the fort burned, lime was not being used at Santa Elena. When the second Santa Elena was built, beginning in 1577, at which time "six pipes [barrels] of lime" were ordered from Havana (Connor 1930: 13), imported lime began to be used, made from limestone. By 1580, however, oystershell mortar had begun to be used as seen in the following quote from a letter from Pedro Menéndez de Marqués to the king, dated March 25, 1580, from Santa Elena (Connor 1930: 283):

> This village is being very well built, and because of the method which is being followed, any of the houses appear fortified to Indians, for they are all constructed of wood and mud, covered with lime inside and out, and with their flat roofs of lime. And as we have begun to make lime from oyster-shells, we are building the houses is such manner that the Indians have lost their mettel. There are more than sixty houses here, whereof thirty are of the sort I am telling your Majesty.

From the witnesses who saw Ft. San Felipe in 1576 and stated there was no lime mortar used in its construction, and from the statement of Pedro Menéndez de Marqués saying it was in use with structures in the second Santa Elena, after 1577, we have a means of dating archeological features from the period of the second town through the presence of oystershell mortar. We also know that the features associated with Ft. San Felipe before it burned in 1576, would have no oystershell mortar present. These are important clues for interpreting archeological features in relation to oystershell mortar.

Fort San Felipe Was Built of Wood, Faggots and Earth

The statement by Bartolome Martinez that Ft. San Felipe was built "of wood, faggots, and earth," allows us to examine forts so built to gain some understanding of how such sixteenth-century forts were constructed. In

1589, Paul Ive pointed out the advantages of an earthen fort using wood, faggots and earth as opposed to those of brick or stone (Ive 1589: 29).

> There is another manner of fortifying which is with earth: in which, instead of a face of bricke or stone, is a face of turffe used, and for the Counterforts, faggots: which manner of building is of little charge in respect of the other, and yet is much more durable against a forceable batterie. The experience thereof hath been sufficiently seene in this late warres of ye Low Countries; but it is not so durable against the wether: but being of good earth and the foggots greene, it wil the longer continue: and although the face wast and moulder away with the wether, yet will the Fort continue defenceable. And the best is, the face may be repayred againe with little charge.

The French Fort Caroline, built in 1564 on the banks of the St. Johns River in Florida was a fort built of wood, faggots and earth, being described by its designer, Rene de Laudonniere (Robinson 1976: 15). The fort was triangular, but this fact need not concern us here since we are interested in construction details.

> Our Fort was built in forme of a triangle. The side toward the West, which was toward the lande, was inclosed with a little trench and raised with turves made in forme of a battlement of nine foote high: the other side which was toward the River, was inclosed with a Pallisado of plankes of timber after the manner that Gabions are made. On the South side there was a kind of bastion within which I caused an house for the munition to be built: it was all builded with fagots and sand, saving about two or three foot high with turfes: whereof the battlements were made...Loe here in brief the description of our Fourtresse, which I named Caroline in honour of our Prince King Charles (italics mine).

The west side of the fort had "a little trench" beside of which was a battlement nine feet high made of "turves" and "soil" taken from the "trench." The river side had a "palisade of planks of timber after the manner that Gabions are made." A gabion is a hollow wickerwork cylinder filled with earth used in building earthworks, and "fagots" are bundles of sticks, bound together, onto which earth was thrown to form the ramparts of a fortification. What we have here described is the kind of fort represented at Ft. San Felipe which was built "of wood, faggots, and earth." The fact that the fort was thus described does not mean that they did not very effectively serve the function of defensive positions, or that a great deal of stylized construction detail was not used in their building. This is seen in a section on the building of earthern forts in Paul Ive's The Practice of Fortification published in 1589, quoted in its entirety in Appendix I. Parts of this description will be used in the sections to follow.

Wood

The wood referred to in descriptions of Ft. San Felipe was that used in the post-and-beam construction of the casas fuertes within the outer defensive walls and to the palisade paralleling the moat within the fort, as well as the bundles of sticks (faggots) used in its construction. The burned palisade posts found at the northwest bastion of Ft. San Felipe were generally small, from three to four inches in width, with some being split posts, half-round or slat-shaped ovals, not a very impressive size for a palisade wall.

An explanation may lie in the description of Ft. Caroline, cited above (Robinson 1976: 15). That fort of the period (1564) was said to be enclosed with "a Pallisado of plankes of timber after the manner that Gabions are made." Gabions were a major element in sixteenth century earthen forts being made of sticks held together with wickerwork (Corneweyle 1559: 29). They were also used by besieging armies attacking forts (Fig. 10). They were not always cylindrical, as Figure 11 illustrates, and in such cases they were used to form straight walls, and when small posts or split posts were set into a little trench and interwoven with wickerwork, they might well be described as "a Pallisado of plankes of timber after the manner that Gabions are made." In such cases the face of the parapet wall would have a woven wickerwork appearance as shown in Figure 11. With the small size of the palisade wood seen at Ft. San Felipe, a wickerwork palisade "after the manner that Gabions are made," may well have been used.

When palisade posts were designed to stand alone, with the parapet of earth from the ditch being thrown behind the palisade, the position of the palisade in relation to the ditch and parapet of earth is as seen in Figure 12. The second fort, built in 1566 at St. Augustine, was surrounded by a wooden palisade of logs set into a trench and the sixth fort was said to be:

> built all of timber, the walles being none other but whole Mastes or bodies of trees set up right and close together in of a pale, without any ditch [moat] as yet made, but wholy intended with some more time; for they had not as yet finished al their worke, having begunne the same some three or foure moneths before: so as, to say the trueth, they had no reason to keepe it, being subject both to fire, and easie assault (Robinson 1976: 15).

Such a palisade as described here using large logs or tree trunks would leave an impressive set of postmolds, unlike the small sticks and boards found at the northwest bastion at Ft. San Felipe (South 1983).

The gun platform for the ordinance for the sixth fort at St. Augustine was made of whole bodies of long pine trees "layd a crosse one on another, and some little earth amongst" (Robinson 1976: 15). Robinson points out that such wooden forts required frequent repairs due to decaying of the wood in the Florida climate as well as the danger from fire. At Ft. San Marcos at Santa Elena, built in 1577, after Ft. San Felipe burned, the

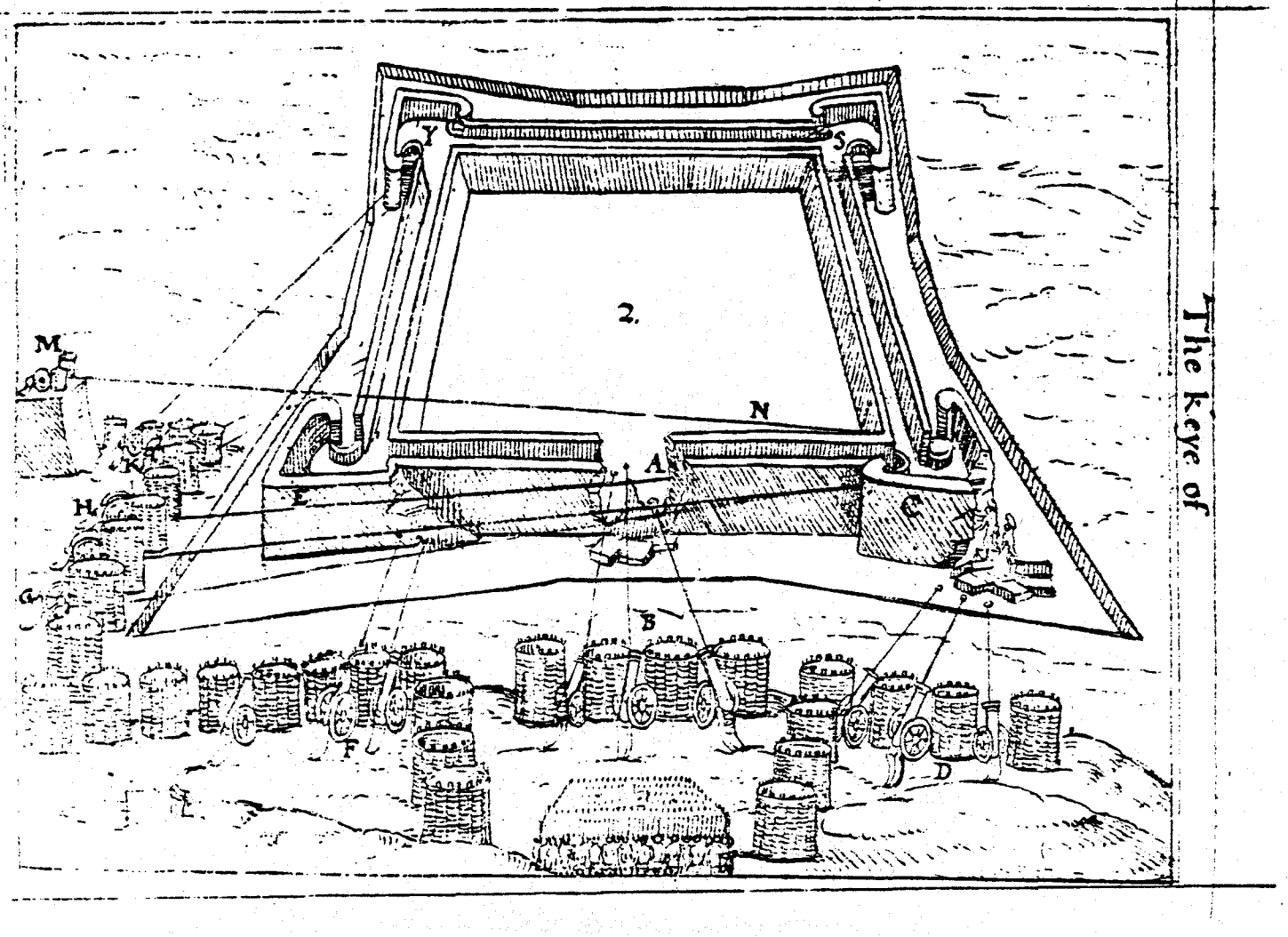
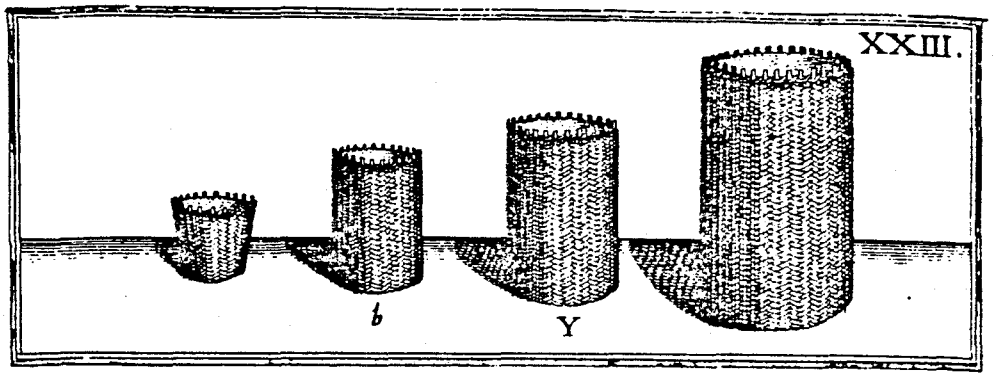


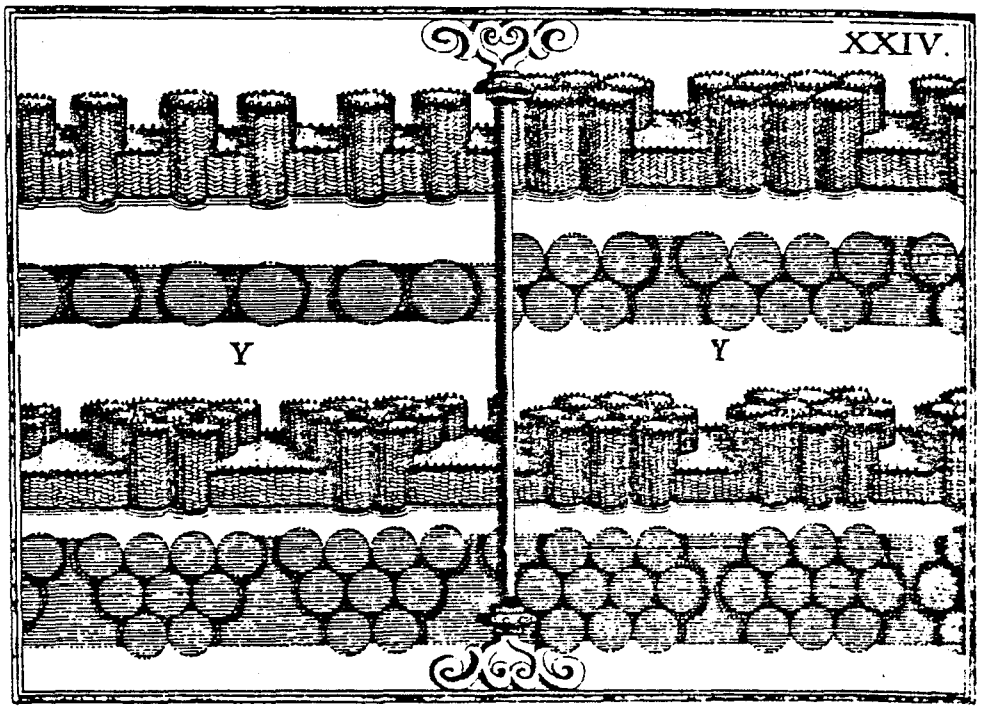
Figure 10. An illustration of a sixteenth century fort showing the use of gabions in an attack on a fort (Corneweyle 1559: 29).

entire central casa had to be rebuilt because of rotten wood in 1582, only five years after it was built (Hoffman 1978: 39). In 1577, Pedro Menendez Marques reported to the king that the fort in St. Augustine was ready to collapse at any time because "sand rots wood." He said the same was not the case at Santa Elena which was built in Savannah. He stated that forts last a period of four years (St. Augustine notes, Archives of the Greater Indies 54-1-5 and 352 p. 4).

Faggots

Faggots are bundles of sticks used in building the ramparts and parapets of a fortification. Earthen bulwarks were constructed by using alternate layers of turf or sod, rows of faggots and the sand or earth thrown from the adjacent ditch or moat. They were sometimes used in constructing mobile defensive walls, such as that shown in Figure 13, or placed upright in a trench to serve as a temporary defensive palisade. Ive's 1589 study of fortifications describes the use of faggots giving specific details (Ive 1589: 33-34):





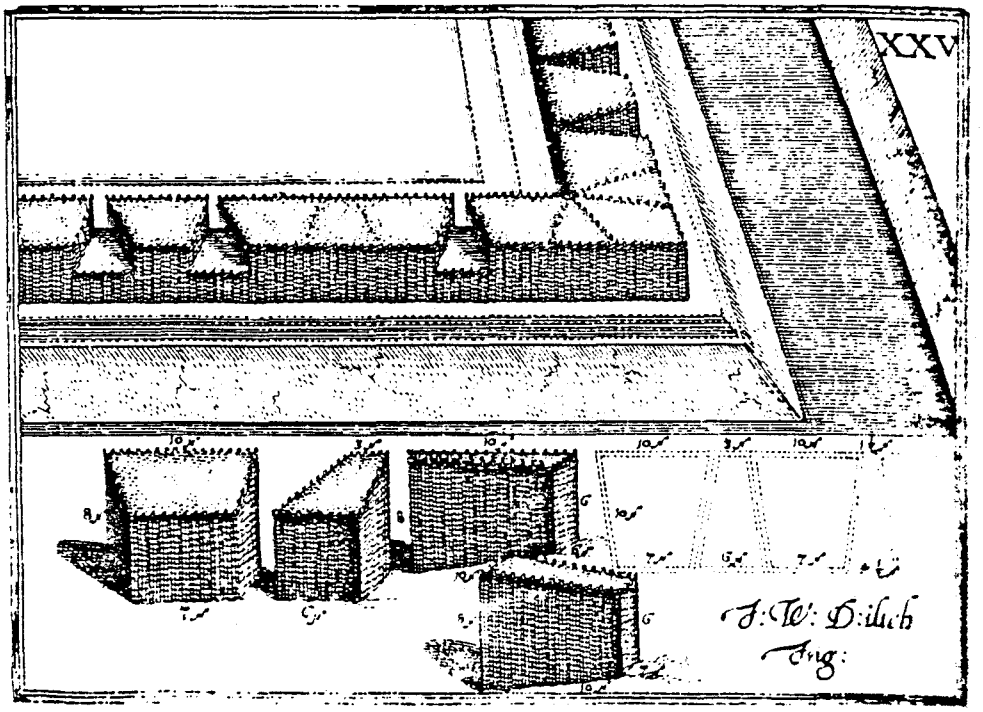


Figure 11. A seventeenth-century illustration of how gabions are used in building earthen fortifications (Dilich 1640).

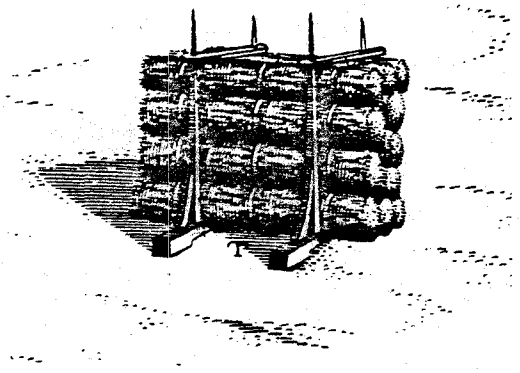


Figure 12. Faggots stacked to make a defensive wall (Dilich 1640: pl. xiix).

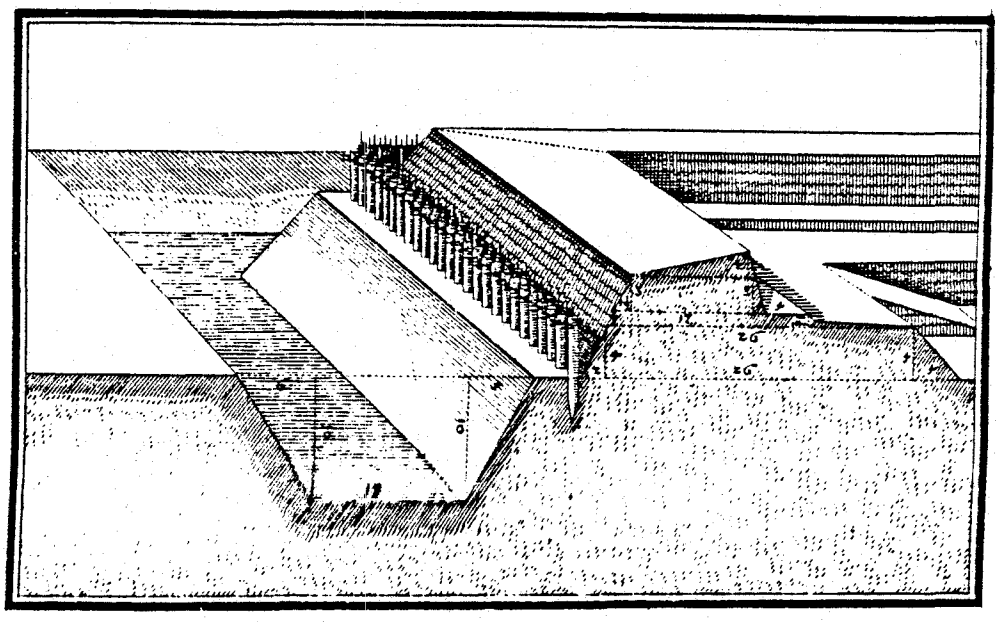


Figure 13. A palisade in the same position relative to the moat and parapet as that found inside Fort San Felipe (Dilich 1640: Pl. XCV).

. . .faggots must be 8. or 9. foote long, and more or lesse as the wood will give them, but not thicker than that you may almost gripe them betwixt your two hands, the great ende of the wood lying all one way in the faggot, which end must be stamped against the ground that it may lye even in the wall, and must be bound with three bonds and layde in the worke the great ends outward, one inch over the turffe, and must be thrust up fast and close the one to the other, but not layd thicker then one fagot at once.

[Raising the Ramparts]

And upon the small ends of those first layd faggots, must other faggots be layde, whose small ends must overlappe the small ends of the said first faggots, some three foote and a halfe or thereabouts. And upon the great ends of these second faggots, must a third faggot be layde, whose small ends must likewise overlappe the great ends of the said second faggots, as the small ende of the second did the small ends of the first, (and where wood is plentie, having haste to raise the worke, lay a fourth faggot in like manner,) which being done, rayse againe the face of the worke five turffes higher, paring them by lyne as is aforesayde, and raysing the earth behinde them as before, and then lay another rowe of faggots, and thus continue the worke until it riseth some twelve foote, above the foote it standeth upon; which foote must be left five foote broade, untill the Fort be full ended to receive the earth which shall be throwne out of the bottome of the ditch, which from thence must be throwne into the Fort, and this foote must be afterward cut narrower flat off, but not so narrowe that it might put the rampire that standeth upon it in danger of falling.

[Raising the Parapet]

Which done, raise a parapet of some fiue or five foote broade, more or lesse, according to the greatness of the Fort, and largenesse of the rampier, and make the ditch if it be where water aboundeth the broader, but standing dry, the narrower and deeper.

[The Ditch or Moat]

A great care must be had in making of a ditch, of the goodnesse of the ground, for feare of laying the worke under feete, to avoide which inconvenience, the best way is to leave the wall a verie good foote, and not to sinke the ditch too deepe on that side next it, but rather to make a secret ditch in the midst, or to make that side next the counterscarpe very deepe, leaving the other side the showler.

[When Wood is Scarce]

> Where wood is scarce, there use none but in the bulwarke only, and there as little as you may, but only to stay the face of the bulwarke; and raise the face of the curtine with turffes only, giving them somewhat the more scarpe, or for a neede use no wood at all, and where turffe would fall out scant, so that the ditch would be well watered, use none but in the bulwarks, and rayse the courtine with earth only, making every way a vertue of necessitie.

From this description of the use of faggots it is clearly seen that materials such as wood, faggots and earth could be effectively used to construct highly regular and stylized fortifications, and as Ive states such forts were easily repaired from the effects of erosion as well as being less subject to being battered down by an enemy.

Earth

As we have seen, faggots were used with turf or sod in alternate layers to construct the ramparts and parapet of a fort, with the soil from the fort ditch being thrown behind and on the facing of turf and faggots. As was the case with the use of faggots, the methods and techniques of using turf was also a regular and stylized procedure in construction of forts of wood, faggots and earth. Such construction involved the use of string lines to keep faces straight, with specific sizes of sod turfs being used to shape the face of the fortification. Ive said (1589: 33):

> The manner of the worke is this: the turffe must be cut like a wedge, of 12. or 14. inches long, and 5. or 6. inches broade equidistant, the one ende 4. or 5. inches thicke, and the other sharpe, and these turffes would be taken in the best ground that lyeth neere about the Fort, and must be cut with a long sharpe Spade, of fiue or five inches broade, and 14. inches long, which must be well steeled, and kept very sharpe: and the turffe must be caryed and handled without breaking, and leyde in the worke, the great end outward, and the grassy side downeward, and scarping, one in 5. or 6. foote, the rampire behinde the turffe rising with the earth that is throwne out of the ditch, as fast as the face of the workes riseth. (And when the face is raised the height of five turffes, and the earth behind it layed even, and spread almost as broade as the rampire is pretended (which may be 20.30 or 40. foote, and more or lesse, as the earth that may be throwne out of the ditch will make it) or at the least so broade as it is thought that the wood will lye: for to say truth, to throwe downe the earth, or to spread it too broade before the wall be raysed, were a point of no great wisedome) stretch a lyne and pare the turffe even with a sharpe Spade, but scarping, according to the first scarpe you layde them at, and then lay a rowe of faggots...

This section has dealt with some of the documentation available for better understanding the fort of San Felipe at Santa Elena. The fact that it was described as made entirely of wood, faggots and earth does not mean that it was not an impressive fort of its time or that it did not serve well the function it was designed to fulfill. The fact that a few dozen men were able to withstand an attack by some 500 Indians speaks well for the design of the fort in withstanding such assaults (Ross 1925: 335F). The archeological features at Ft. San Felipe can better be understood against the background such documentation provides.

Documentation - Artifacts

When Ft. San Felipe was abandoned after an Indian attack of two hours or more in early August of 1576, four bronze cannon and two from the old fort were buried, probably in the moat of the fort (Connor 1925: 201; Ross 1923: 225). Two of these were large cannon discharging balls of 25 pounds in weight, two were demi-culverin and two were sakers (Connor 1925: 241). They were the cause of worry, however, since it was feared that the French might come, and, finding Santa Elena deserted, build a fort there and find the cannon and use them against the Spaniards (Connor 1925: 249).

It took the French only four months to do that. In December 1576, a French vessel, El Principe, appeared at St. Augustine and observed for four days and then went to Santa Elena where it ran aground on the bar. Pedro Menéndez de Marqués reported on the event from Ft. San Marcos:

> They came to land at this fort [Fort San Felipe] which was burned and ruined, where they found your Magesty's artillery that was here, and threw it into the sea. When they first arrived the Indians made very pitiless war upon them, in such wise that there were deaths on the one side and the other; but as soon as they understood that they were strangers, Frenchmen, and friends of theirs, they took them in and showed them much friendliness, and so they remain among them (Connor 1925: 265).

The cannon of Ft. San Felipe were thus thrown into the sea by the French who had free access to the site of the burned fort of San Felipe and the city of Santa Elena from August 1576 until the arrival of Pedro Menéndez de Marqués in the summer of 1577, to build the new Ft. San Marcos, 200 yards south of Ft. San Felipe's ruins (Fig. 2), and to construct seven outposts beyond the fort (Connor 1925: 267-269; 1930: 83). These seven outposts are of interest in that they were said to have been built every 25 or 50 paces apart to prevent the Indians and Frenchmen from reconnoitering Ft. San Marcos. Marqués says he build Ft. San Marcos on open ground 150 paces from the edge of the woods, or roughly 450 feet (Connor 1925: 267). Beyond that distance, there was 150 feet remaining to the ruins of Ft. San Felipe located within the woods. Marqués says he located the seven outposts "every 25 or 50 paces," or about every 75 to 150 feet. If we assume

that the outposts would be further apart on the open ground to the north of Ft. San Marcos and closer together within the woods toward Ft. San Felipe, there would be three outposts 150 feet apart between Ft. San Marcos and the woods, making 450 feet in all. If the outposts within the woods were 75 feet apart, two of the four remaining outposts would comprise the distance to the south moat of Ft. San Felipe, with the two remaining ones located within the fort itself. In other words, using Marqués' paces converted to feet, we find that his seven outposts likely covered a distance of 750 feet from the new fort, whereas the distance to the northern edge of Ft. San Felipe is also 750 feet. The outposts did not extend beyond the distance to Ft. San Felipe's ruins, suggesting an interest in preventing that work from being occupied and used as a defensive position from which to launch an attack against Ft. San Marcos.

When Pedro Menéndez de Marqués arrived at the site of burned Santa Elena and Ft. San Felipe in the summer of 1577 to build Ft. San Marcos, he found the poop of the French vessel El Principe, and discovered that the 100 to 180 Frenchmen she had carried had built a triangular fort in the woods near a river north of Santa Elena, which he destroyed (Connor 1930: 81, 89; Ross 1923: 261-62). He also located the artillery pieces from Ft. San Felipe that had been thrown into the sea and placed them in Ft. San Marcos (Connor 1925: 269).

From this history of the artillery once used inside Ft. San Felipe it is unlikely that any cannon will be found inside the remains of the fort. However, cannonballs, arquebus and musket balls, armor fragments and weapons such as arquebus fragments or crossbow points might well be expected to be recovered within Ft. San Felipe. For instance ingots of lead, "500 lead balls for muskets and a thousand for arquebus and 600 iron balls for large and small artillery," were listed among the provisions in Ft. San Marcos in 1578, and similar items would have been on hand at Ft. San Felipe before it was abandoned (Ross 1925: 365). One of the weapons was the crossbow, and these, plus crossbow hooks and cord were listed among the items of material culture in Florida between 1565 and 1569 (Paul Hoffman, personal communication from the accounts of Juan de Junco, Factor at St. Augustine, in AGI:CD 941). Bullet molds, helmets, scrapers, bucklers, pikes, quilted body armor, arquebuses, and other military supplies and accouterment were also listed at that time.

During the weeks in July and August of 1576, when the Indians were in arms, during which 37 Spaniards were killed, the inhabitants of Santa Elena were housed inside Ft. San Felipe, during which time the usual domestic refuse would have accumulated inside the fort, such as nails, spikes, Indian pots for cooking (calderas), ollas and large earthen jars (zalona) would have been used, broken on occasion, and discarded in refuse pits and into the moat along with oystershells and other kitchen garbage (AGI:CD 941, courtesy Paul Hoffman; Connor 1925: 249; Connor 1930: 5).

This discussion of various artifacts, from cannon to crossbow parts, from pottery to nails and spikes, provides a cursory look at the artifacts likely to be recovered from excavation within the walls of Ft. San Felipe. A definitive study of the material culture of the Spaniards at Santa Elena in relation to St. Augustine and Spanish Florida generally, awaits further research in the earth and the archival documents available.

Documentation - Features

In previous sections we have examined the documentation relating to the architectural and artifact data expectations at Ft. San Felipe. We have also seen how the French occupied Santa Elena for some unknown period of time in December 1576 and the early months of 1577, when the fort and Santa Elena were abandoned. During this period they located and dug up the artillery pieces buried, perhaps in the moat of Ft. San Felipe, and threw them into the sea. This activity would have produced an intrusive feature into the soil zone where the cannon were buried. In this section we will look further at the possibility for features at Ft. San Felipe postdating the burning of the fort.

The dissemination of more than one hundred Frenchmen among the Indians as a result of the wreck of the El Principe, and the ferment among the Indians instigated by the French, became the primary concern of Pedro Menéndez de Marqués at Ft. San Marcos during the years from 1577 to 1581 (Ross 1923: 281). As we have seen in the previous section, Marqués constructed seven outposts over a distance of 750 feet beyond Ft. San Marcos to the ruins of Ft. San Felipe to prevent the Indians and French from getting too close to the new fort. The construction of these outposts would have produced intrusive features into those formed during the occupation of Ft. San Felipe.

During the years of the crisis with the French and their Indian allies, Marqués appealed often for more men and supplies in order to do the job necessary to secure the land for Spain. He needed stronger support "so that we shall not be guarding two wooden houses [at St. Augustine and Santa Elena] which any corsair who may come could seize with his fingernails" (Connor 1925: 273). During this period he was building the new Santa Elena where there were sixty houses in 1580 (Connor 1930: 283). It is entirely likely that during this crisis period of defensive preparations that the moat and other ruins of Ft. San Felipe were made secure from the possibility of its being used as a base from which an attack could be launched on Ft. San Marcos 200 yards away. Part of this defensive preparation would have been to fill in the moat, and, perhaps, to salvage usable timbers for use in the new town. Indeed, excavation at the northwest bastion demonstrated that after the fort was burned in 1576 someone did backfill the moat (South 1983: 59). Such activities on the Ft. San Felipe site would produce archeological evidence in the form of intrusive features into previous features inside the fort, or as backfill such as was found inside the moat.

Archeology - The Casa Fuerte Features

The Casa Fuerte Ditch (162G-175; 222-229)

As the topsoil zone was removed from the area of the 30 by 120 foot area inside Ft. San Felipe a ditch two and one-half feet wide was found extending from the east profile, turning north at an 86° angle for a distance of 70 feet, and turning again toward the east at a 94° angle (Figs. 6 and

14). By excavating areas 244, 245, 247, and using data seen in sample square 18, a parallelogram 50 by 70 feet was seen to be delineated by the ditch (Fig. 6). The provenience number 175 was assigned to generally designate the entire ditch.

When the ditch was excavated it was divided into 10-foot units for provenience control of any artifacts that may come from the fill soil. These units, numbered from 222 through 229, can be seen in Figure 6. The east profile through unit 229 is seen in Figure 15, revealing the ditch to be at a depth of three and one-half feet from the present ground surface. The same ditch (Fea. 175) is seen in the profile in Figure 16. The mottled nature of the fill suggests that the ditch was intentially backfilled.

In area 226 of the ditch .4 feet from the bottom, a darker fill area suggested that perhaps a timber had rotted in place here. At the same elevation (5.5 ft.) in areas 225, 226, and 227, iron spikes were found in the ditch with the points down, as though once fastened in position within a wooden beam. These were the only suggestions that the ditch may have contained some wooden architectural elements, but these were certainly not definitive. The interpretation of this ditch therefore, is that it was dug and then backfilled shortly thereafter, with whatever posts, faggots, boards that it held being removed before they could rot or burn, leaving little clue to their nature.

The Casa Fuerte Postholes
(173, 198, 203 profile, 237 [148, 170, 239])

Three areas of ditch 175 were found to have a concentration of midden material within the ditch fill, such as Spanish pottery fragments, pieces of bone, corncobs, etc. One of these was located at each corner of the ditch (Fig. 6), and another at one-third of the distance from the northwest corner. These were assigned provenience numbers for isolating this material since the ditch was characterized by having no midden in the fill in most areas. These numbers were 173, 198 (with cobs from the 198 feature being assigned 197), and 237 (Fig. 6). As these areas were excavated it was found that they were postholes that had once been located in the ditch, with midden material slumping into the hole after the posts no longer remained. Features 148, 170 and 239 were found to also represent a posthole, but in this case not in ditch 175, but 32 feet from it toward the east from posthole 198 (Fig. 6). These postholes proved to be the architectural remains of the casa fuerte building as well as a later structure on the same spot using the same postholes. The evidence from the postholes is presented in the following sections.

Posthole Features 148, 170 and 239

When sample square 25 was excavated a small fragment of Spanish armor was found in the northwest corner of the square in the edge of a feature. In order to delineate the feature and to determine if larger fragments of armor could be found within it, an area 10 by 20 feet was excavated around Square 25 (Fig. 6). This revealed a large pit feature with a dark fill along the eastern edge (170) that had been intruded into by another pit

Figure 14. The excavated 30 by 120 foot area inside Fort San Felipe.

Figure 15. North profile of area 225 in the casa fuerte ditch.

Figure 16. East profile of area 229 in the casa fuerte ditch.

(148). At the northern side of the feature the fill was very light, apparently representing the original backfill of the hole (239). The relationship of these three features in plan view can be seen in Figure 6.

As excavation of the east half of this complex feature was carried out by John Goldsborough, a sequence of events represented by the archeological clues began to unfold (Figs. 17, 18, 21). A large hole had originally been dug (Fea. 239) by the Spaniards as they built the casa fuerte, with a shelf located on the south side, a situation often seen when large posts are being placed in a hole or when it becomes necessary as a platform on which to throw dirt being excavated from the hole as a first stage in moving it out of the hole. This hole and shelf area are seen in Figures 17 and 18 at the left and right sides of the profile, the original posthole being 3 1/2 by 5 1/2 feet in size. The soil of Feature 239 is a light mottled color not much different from the subsoil color, revealing that it was backfilled into the hole shortly after the hole was dug. This is the case when a post is placed in a hole and backfilled. Feature 239, therefore, represents the first event in the sequence of these features, backfilled soil against a post set into the hole.

A dark humus lens were seen on both sides of the profile at the bottom of the hole (Figs. 17, 18, 21). This suggests that the hole was allowed to stand open for enough time for leaves and other debris to accumulate in the hole to form this humus zone, and that once the hole was dug it was some time before the post was placed within the hole.

The third event reflected in this profile (Figs. 17 and 18) is a mass of charcoal in conjunction with a burned edge of charcoal and scorched sand associated with it. The first thought would be that this was the burned remain of the post that was set into the hole. However, the charcoal is not that from a large post but, rather, is composed of small sticks lying at various angles as though representing the remains of a bundle of sticks. An additional question that arises in regard to this charcoal mass is the fact that the soil is scorched from the burning of these sticks at a depth of over three feet from the present surface. Oxygen must be present to produce in situ burning such as this, which would not be the case if the burned sticks had been buried with soil at the time they burned! In interpreting these data, therefore, we must take into consideration the fact that oxygen was present deep within the hole when the sticks (forming a burned edge within the backfilled outer hole) burned (Figs. 17 and 18). It appears, therefore, that when the post was placed in the hole and before the hole was backfilled, a circular area around the post was lined with bundles of sticks, faggots, (which would allow oxygen to reach a depth of over three feet) and then the post, surrounded by faggots, was backfilled, producing Feature 239. When Ft. San Felipe was burned by the Indians in August 1576, the faggots would have allowed oxygen and fire, fueled by sticks, to reach a depth of three feet and scorch the sand around the edge of the post area. It should be noted that no burned remains of the post itself were seen.

Why would faggots have been placed around a post instead of simply backfilling soil against the post itself? The answer likely lies in the fact that the Spaniards well knew that "sand rots wood," and this was perhaps a means of trying to extend the life of the fort beyond the known

Figure 17: Profile of Features 148 and 239. Note the charcoal from burned faggots below the mass of lime lumps around the second post in the hole.

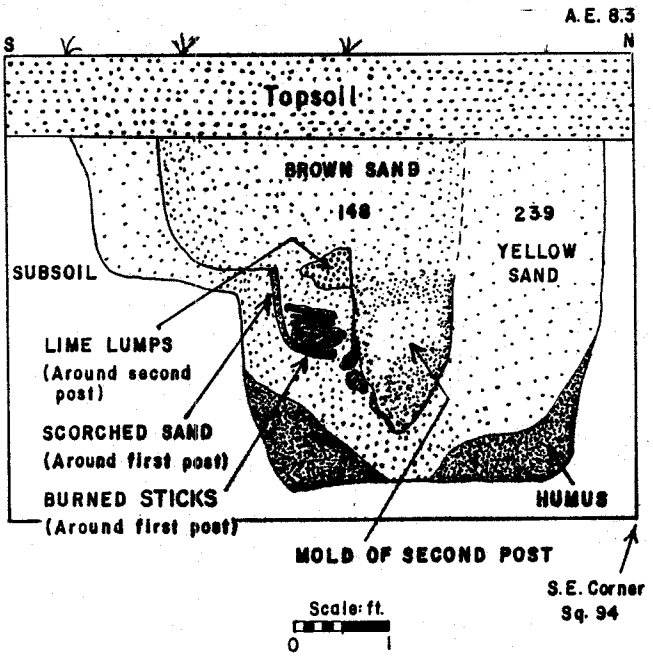


Figure 18. Profile drawing of Features 148 and 239, showing the relationship of the first and second posts in the hole.

fact that because of rot, "forts last four years" (Robinson 1976: 15; Hoffman 1978: 39; AGI 54-1-5 and 352, p. 4). This interpretation is certainly in accord with these archeological data requirements as well as documentary evidence.

Returning to our analysis and interpretation of these data shown in Figures 17 and 18, it is seen that the burned edge of the faggot bundle-lined hole does not extend around the west and north sides of the inner part of the central hole (Fea. 148), (Figs. 17 and 18). This is because Feature 148 (the central part of the posthole) intrudes upon the burned remains of the faggot-lined hole. This feature also intruded on the upper part of a shallow pit extending from the posthole toward the southeast which we have designated as Feature 170 (Fig. 6). In Figures 17 and 18, this basin-shaped feature has been removed. The interpretation of this feature (170), which dates after the burning of the sticks within Feature 148, (since disturbed charcoal stick fragments were found within it), but before the later intrusive event of Feature 148, is that it resulted from digging to remove the original post which stood in the hole when the sticks around it burned, scorching the post. This activity destroyed the upper evidence of the burned sticks around the post as did later activity when the upper intrusive part of Feature 148 (Figs. 17 and 18) was dug to put a second post into the hole. The removal of the original post, therefore, was the fourth event revealed by these data in this group of features.

The placing of a second post in almost the same posthole produced the inner part of Feature 148, the postmold of which is seen in Figures 17 and 18. This was the fifth event represented by these data in these features. When this second post was placed in the hole where the first had been, some soil was placed around it as backfill, thus producing a sand layer of fill above the pile of charcoal sticks. Wherever this new posthole cut into the burned edge of the first posthole the charcoal edge and scorched sand were destroyed, producing flecks of charcoal sticks, occasionally, within the fill around the second post. The intrusion of this second post into the burned remains of the sticks around the first post is seen in Figures 17 and 18. This second post was apparently allowed to rot in place since the postmold remains to be seen.

An important element of this second post was that lumps of lime were placed around it. This mass of lime was not from oystershell mortar used on wattle-and-daub walls to form a white coating, but appeared to be the type of lime that might result as a by-product from a like kiln operation. As the mass within the second posthole was revealed, it was found that it formed a slightly angular configuration on the inside edge as though it had been placed against a post (Fig. 17), the postmold of which is seen in the profile. This was the sixth event involved in the set of behavioral events represented by this group of features.

As the lime lumps were revealed, it was at first thought that they were likely put into the hole against the post to keep the post firmly anchored into the posthole. However, the relative thinness of this layer of lime lumps, a situation seen in other postholes, suggests it was not used as chocking material forcing the interpretation that this lime was intended to absorb some of the ground moisture in the area of the post to retard rotting of the post in a similar manner to the faggots found to have

been used around the first post in the hole. As the documents have revealed, the Spaniards were well aware of the need to somehow retard the rotting of wood used in forts so they would last longer than the usual four years. The use of posts surrounded by faggots in postholes and the use of lime lumps around posts set in earth were apparently a means of doing this.

In regard to the lime lumps used around the second post, it is interesting to note that the first use of lime is mentioned at Santa Elena at 1577, at Ft. San Marcos, when six pipes (barrels) were ordered from Havana (Connor 1930: 13). The burned sticks and scorched earth around the first posthole most likely represent the burning of Ft. San Felipe and Santa Elena by the Indians in 1576 (Connor 1925: 201; Hoffman 1978: 23; Lyon 1984). The first post in the hole did not burn even though the sticks around it did, but rather, was removed, probably for use in new construction at the site of the new Santa Elena or Ft. San Marcos when the Spaniards were rebuilding in 1577. The second post was likely placed in the hole during the period of strengthening of Santa Elena by Pedro Menéndez de Marqués after the 1577 shipment of barrels of lime appeared at Santa Elena. We know from sampling carried out at Ft. San Marcos that lime mortar was indeed used there over wattle-and-daub walls, and it now appears that some of the lime lumps from Havana were used in the postholes for some new construction at the site of the casas fuertes at Ft. San Felipe (South 1980). We also know from the documentation that outposts were constructed by Marqués to prevent the French and Indians from spying on the newly built Ft. San Marcos (Ross 1923: 281; Connor 1925: 267-269, 273). The site of the casas fuertes was apparently used during the second Santa Elena period, beginning in 1577, probably as an outpost position protecting Ft. San Marcos. This outpost was apparently constructed in the same postholes as those of the casas fuertes inside Ft. San Felipe. We will now examine other posthole data in the casa fuerte to see whether this sequence of interpreted events is verified through the recognition of a pattern.

Posthole Feature 198

At a point 32 feet west of the posthole features discussed above, Susan Jackson excavated the south half of Feature 198, also a large posthole feature (Figs. 19, 20). This area of the casa fuerte ditch contained a quantity of Spanish midden material at the surface below the topsoil zone, including a charcoal corncob feature (Fea. 197), Spanish sherds, Indian sherds, and of particular interest a fragment of bordado from an upper-class Spanish gentlemen's costume with a faceted garnet bead attached (Figs. 6, 20, 30E).

This feature was intrusive into the ditch of the casa fuerte (Fea. 175, in 10-foot span #226), but extending beyond the edge of the ditch (Figs. 20, 21). The west edge of the ditch could be seen, which was the first event seen represented in the profile of the feature (Figs. 19 and 20), with the original fill soil into the ditch being the second event of interest. The third event was the placing of the first post into the intrusive posthole feature and, as was the case with Feature 148, surrounding it with a row of faggots which are seen in the burned concentration of sticks in Figures 19-21. Again, as in Feature 148, lime lumps are seen to lie separated from the burned sticks by sand, probably also reflecting the use of lime lumps around a second post. This represents the fourth event.

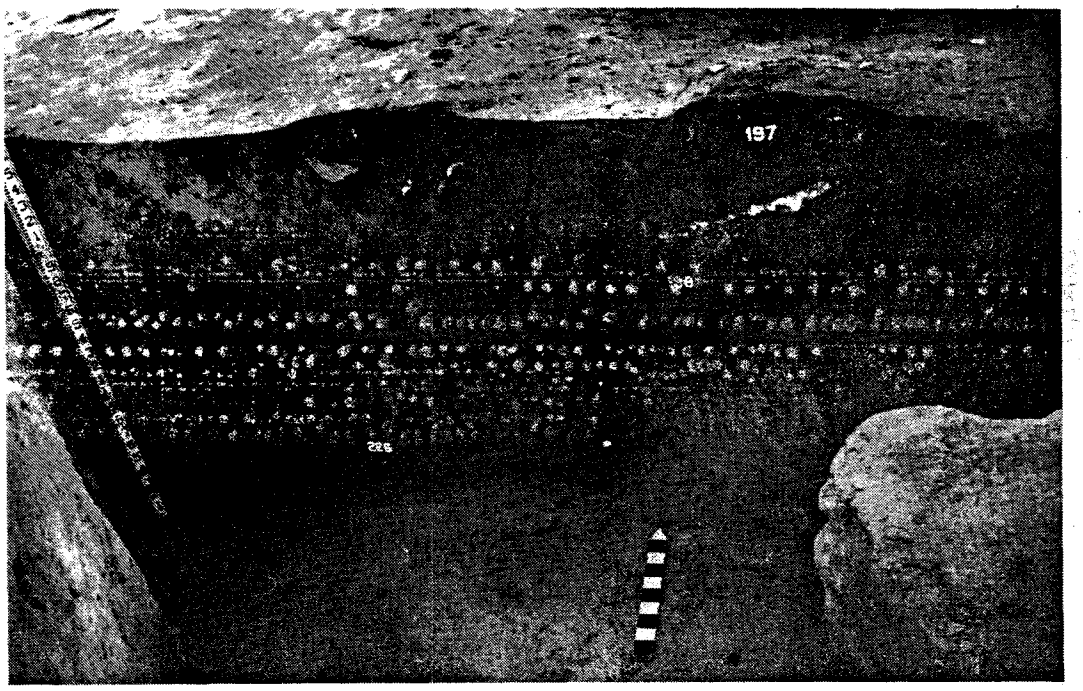


Figure 19. Profile of casa fuerte posthole #198 intruding into the casa fuerte ditch at area #226, in relation to corncob Feature 197.

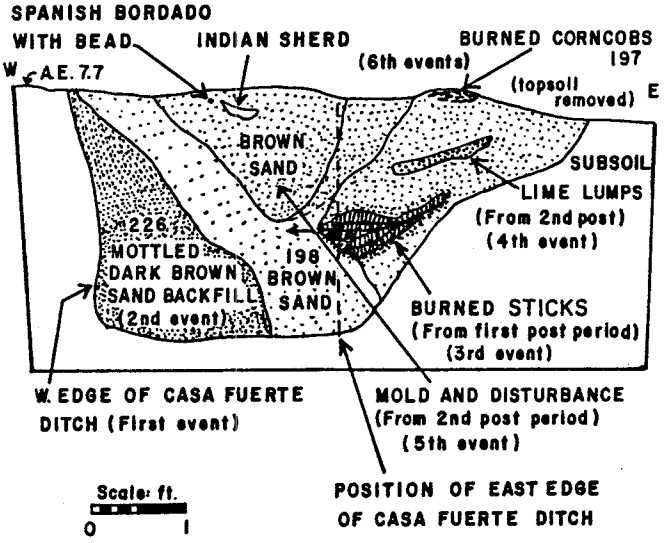


Figure 20. Profile drawing of casa fuerte posthole 198 in relation to casa fuerte ditch at area #226.

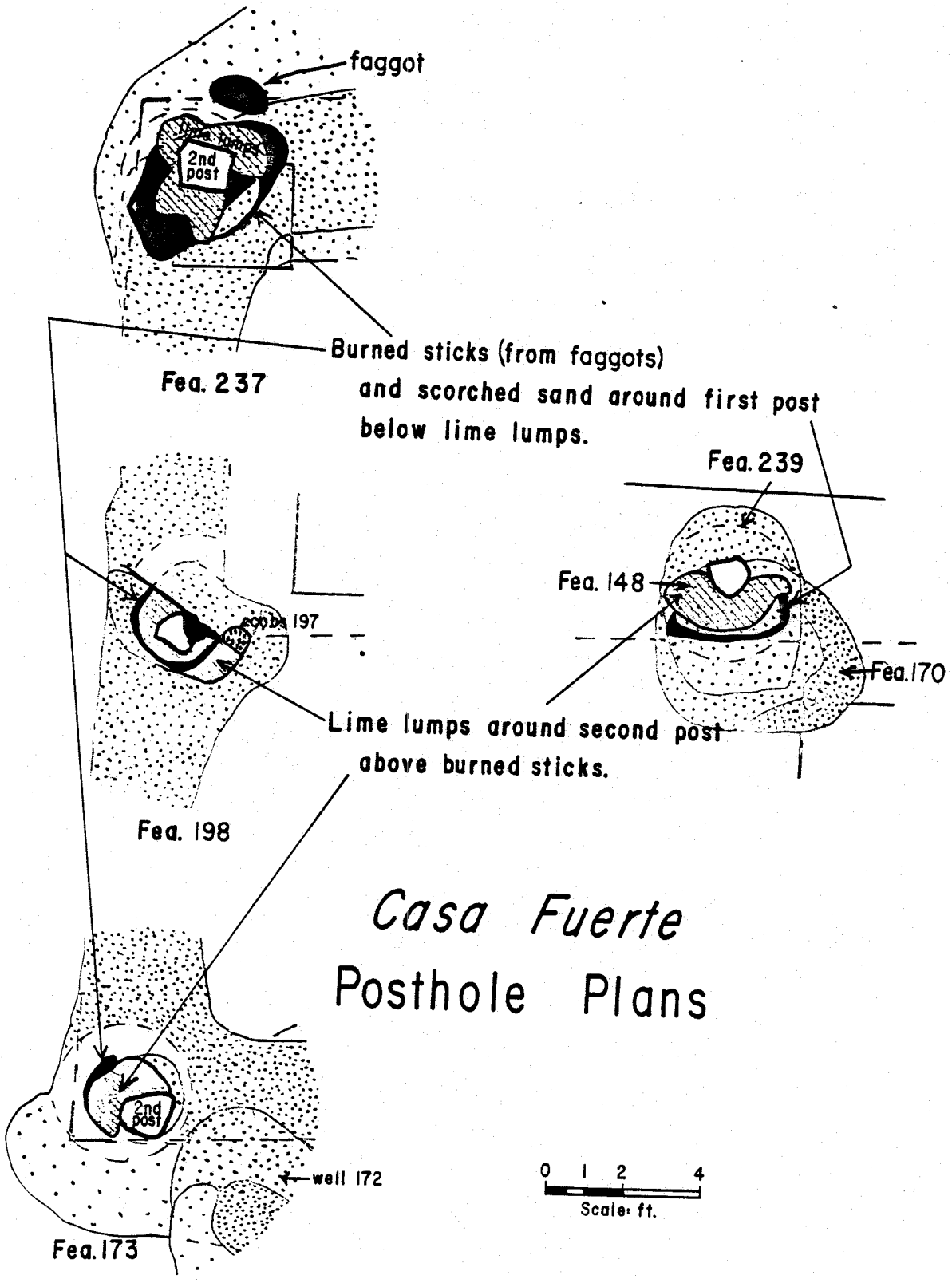


Figure 21. Casa fuerte posthole plans showing the relationship between the burned faggots around the first post and the lime lumps around the second post.

The fifth event is seen in the brown sand central area of the feature which appears to be a darker postmold feature from the second post which probably rotted in situ (Figs. 19, 20). The sixth event is the rotting of the post and the subsequent collapsing into the posthole depression of Spanish midden lying around the post as it rotted, some of which settled and fell into the depression.

An important difference between this feature and Feature 148 is that this feature is in association with the casa fuerte ditch but intruding onto it, and extending beyond it. This means that it was not until after the casa fuerte ditch was dug by the Spaniards and backfilled, that this large posthole feature was dug into the backfilled ditch and extending into the area beyond it toward the east (Figs. 19-21). We then have evidence for a burning of sticks within that hole, such as would be caused by a row of faggots around the post in the hole, but no sign of the post itself, suggesting that this post too, was removed to make way for a second construction using the same hole, around which lumps of lime were used, probably to curtail the rotting of the post through sweetening of the soil around it. This seems like a lot of activity to take place between 1572 when the casas fuertes were first completed and 1576 when they were burned. Before we get into this problem we will examine other posthole data from the same structures.

Posthole Feature 237

At the northwest corner of the casa fuerte ditch (Fea. 175 in area 228), Bill Hunt totally excavated a large posthole feature #237 (Figs. 6, 21). This feature was discovered when sample square 30 was excavated early in the field season. Square 30 was excavated deep enough to reveal a mass of lime lumps in the upper part of the square below the topsoil zone. When the entire area was excavated it was found that this square had been positioned directly over feature 237. When excavation of this feature was carried out below the level of the lime lumps a roughly rectangular edge of scorched sand was seen and a concentration of burned wooden stick fragments were seen near the bottom of the feature, outlining an area three by four feet (Fig. 21). Again, the lime lump mass was clearly separated from the earlier burning of faggots within the hole around a central post. The second post shape was clearly seen in this feature, being roughly 1 foot by 18 inches and having five sides outlined by the lime lump mass around it (Fig. 21). This was above and separate from the earlier burned faggots, though the post apparently intruded to the bottom of the posthole in this case. Again these data have suggested a similar sequence of events took place at this corner of the casa fuerte ditch.

This Feature 237 produced the most positive evidence for the presence of faggots around the post in these postholes. Here, at the north edge in the bottom of the posthole, isolated from the other remains of the burned faggots, the c al outline of a single burned faggot was seen, composed of a thick mass of burned sticks with scorched sand around it (Fig. 21).

Posthole Feature 173

At the southwest corner of the casa fuerte ditch an area of Spanish midden was again found, containing straight pins, bone fragments, Spanish

and Indian pottery fragments, etc. (Fig. 6). This feature was designated as #173 (Figs. 6, 21). It too was found by Bill Hunt, to contain lime lumps below the midden slumped into the depression of what had once been a posthole. The lime lumps made an angle on the inside edge, as had been seen at Feature 148, caused by it having been placed against an angular post (Figs. 21-22). The profile of the feature revealed that the mass of lime lumps was not very deep (Fig. 23), probably having been placed around the second post in the hole. After the photograph in Figure 23 was taken, the excavation was continued deeper by Ken Sassaman and a mass of burned charcoal sticks was found, probably representing the burning of faggots around the original post in the hole. As usual, no sign of a burned post was seen, it having likely been salvaged before the second post was positioned in the hole and lime lumps placed around it.

Posthole Data in Area 224 of the Casa Fuerte Ditch

By the time the above pattern of intrusive postholes into the casa fuerte ditch was recognized (Fig. 21), it became apparent that at a distance of 24 feet or so north of posthole Feature 173, yet another casa fuerte posthole should be found intruding onto the ditch (Fig. 6). However, this was an area where four intrusive Marine Corps ditches crossed above the casa fuerte ditch, and it seemed unlikely that any except the deepest data would survive the intrusion of the Marine Corps ditches (Fig. 7). As the Marine Corps ditches were excavated to answer this question, lumps of lime were found in the ditch fill. When the bottom of the intrusive ditches was reached and the walls of the Spanish ditch below them examined, a mass of charcoal sticks was seen in an area where an intrusive posthole feature had extended beyond the edge of the casa fuerte ditch! This was recorded and is seen in Figure 6, in area 224 of the casa fuerte ditch. These data completed the set of four posts that had once been placed intrusively into the west side of the casa fuerte ditch before the structure was burned in 1576.

Discovery of Posthole Features 244, 245, and 247

With the distance between casa fuerte posthole features 148 and 198 being 32 feet, it was thought that another posthole should be found just north of sample square 95 (Fig. 6). With this in mind square 95 was extended toward the north two feet, resulting in the discovery of a mass of lime lumps forming an arc within a posthole, and by excavating deeper the by-now-familiar mass of charcoal sticks forming an arc at the bottom of the hole as it stood filled with faggots around the post when the casa fuerte burned. This layer of burned sticks by now had become known as "the charcoal smile," since it was seen to be a predictable feature in the bottom of casa fuerte postholes.

The distance of 32 feet was verified through Feature 244, as being one of the sides of a rectangular area 25 by 32 feet. It was suspected that posts along the long axis (32 ft.) of this rectangle would be on 16-foot centers. With this in mind, therefore, a distance of 16 feet was measured toward the east from the posthole in square 244, and a 3 by 4 foot rectangle was excavated to try to locate evidence for yet another casa fuerte posthole (Fig. 6). This discovery hole #245 revealed a mass of lime lumps at the northwest corner and a ditch extending from the east-west casa

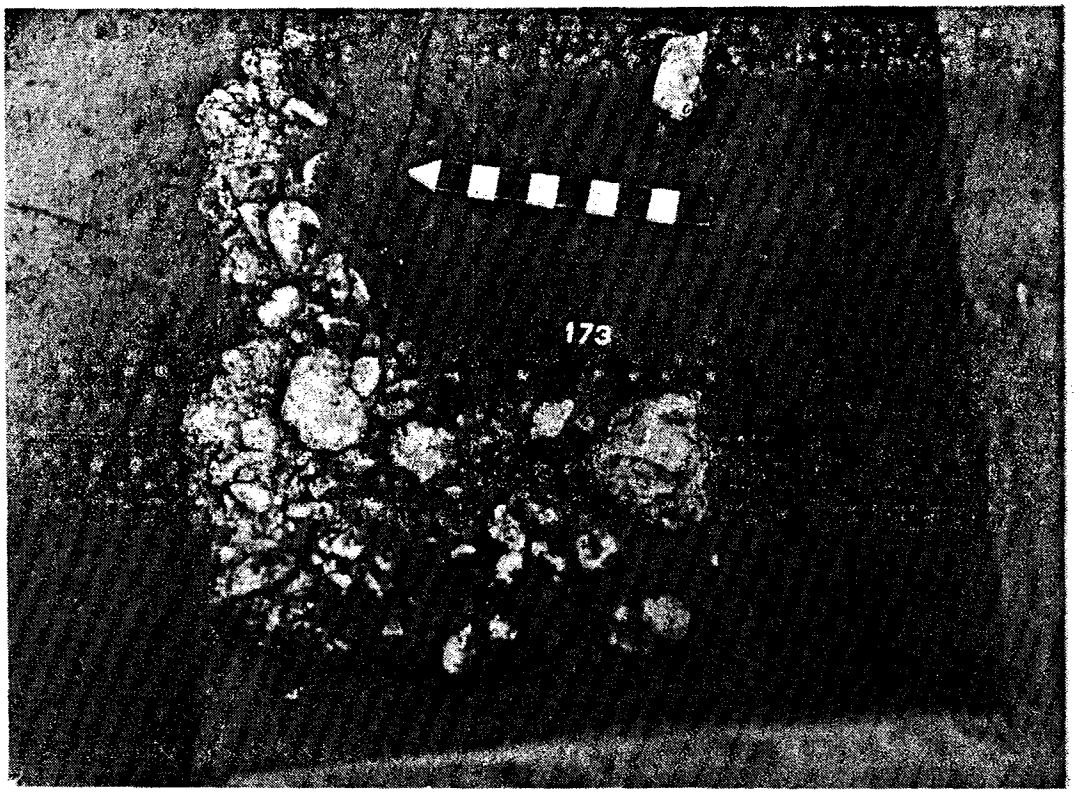


Figure 22. Plan view of casa fuerte posthole 173, showing angle of second post outlined by a lime lump mass.

Figure 23. Profile view of casa fuerte posthole 173, showing the thickness of the lime lumps around the second post.

fuerte ditch toward the south, parallel with the 70-foot long ditch forming the west side of the casa fuerte. The west edge of this ditch was found by extending sample square 27 a few inches toward the east (Fig. 6).

As further verification for this ditch and to possibly locate yet another casa fuerte posthole, a five-foot square was excavated at the northwest corner of the area opened to reveal Feature 148 (Fig. 6). This square #247 revealed the west edge of the north-south casa fuerte ditch and a mass of lime lumps at a distance of 16 feet from Feature 148. This verified the fact that we were dealing with a series of roughly 16 by 25 foot rectangles, with three together at the north end of the casa fuerte forming an area about 25 by 50 feet, with a two and one-half foot wide ditch extending around the outside of nine of the rectangles (Fig. 6). By now the presence of a mass of lime lumps at the junction of the topsoil zone with the subsoil was a firm indication of the presence of one of the casa fuerte postholes. Knowing this we no longer excavated below the level where the lime lumps were seen. The west edge of the north-south ditch was seen in sample square 18, verifying the fact that the ditch continued on toward the south.

An additional exploratory search was made in square 248 (Fig. 6) toward the east from Square 245, but the entire Spanish record was missing here, this area being where erosion had once cut away the site and it had been stabilized by Marine Corps fill (Fig. 6). With the discovery of the north-south ditch it became apparent that we were dealing with an area 50 by 70 feet, or (using 11 inches for the Spanish measurement for a pie) 55 by 76 pies in size containing 9 rectangular areas of post-and-beam construction. It is interesting to note that this 50 by 70 foot measurement is very close to the 52.2 by 69.6 size of the casa at St. Augustine (Hoffman 1978: 9a, 9b).

The Casa Fuerte Posthole in the East Profile of Feature 203

At the southwest corner area of the casa fuerte the casa fuerte ditch intruded into a moat-like feature #203 (Fig. 6). The profile against the east wall of the excavated area reveals a number of interesting details, one of which was another profile through one of the casa fuerte postholes (Figs. 24, 25). Again we see the faggot "smile" of burned sticks at the bottom of the casa fuerte posthole which intruded into the ditch, above which, separated by a layer of sand, is seen lenses of lime lumps deposited after the burning took place (Figs. 24, 25).

The first event reflected in this profile, however, was the excavation by the Spaniards of a moat (Fea. 203), eight and one-half feet wide and about three feet deep from the present surface of the ground. This moat or ditch feature had been allowed to stand open for some period of time after the Spaniards dug it since the profile reveals that oystershell midden was discarded into the moat shortly after it was dug. After this was done the moat continued to stand open, during which time grey sand washed into the moat, covering the oystershell midden. More time passed, and the moat began to stablilize as leaves and other organic materials washed and blew into the moat, to a depth of two feet, producing a dark brown humus layer as the topsoil zone above the moat (Fig. 24, 25). This filling of the moat with oystershell midden and erosional sand was the second event revealed in

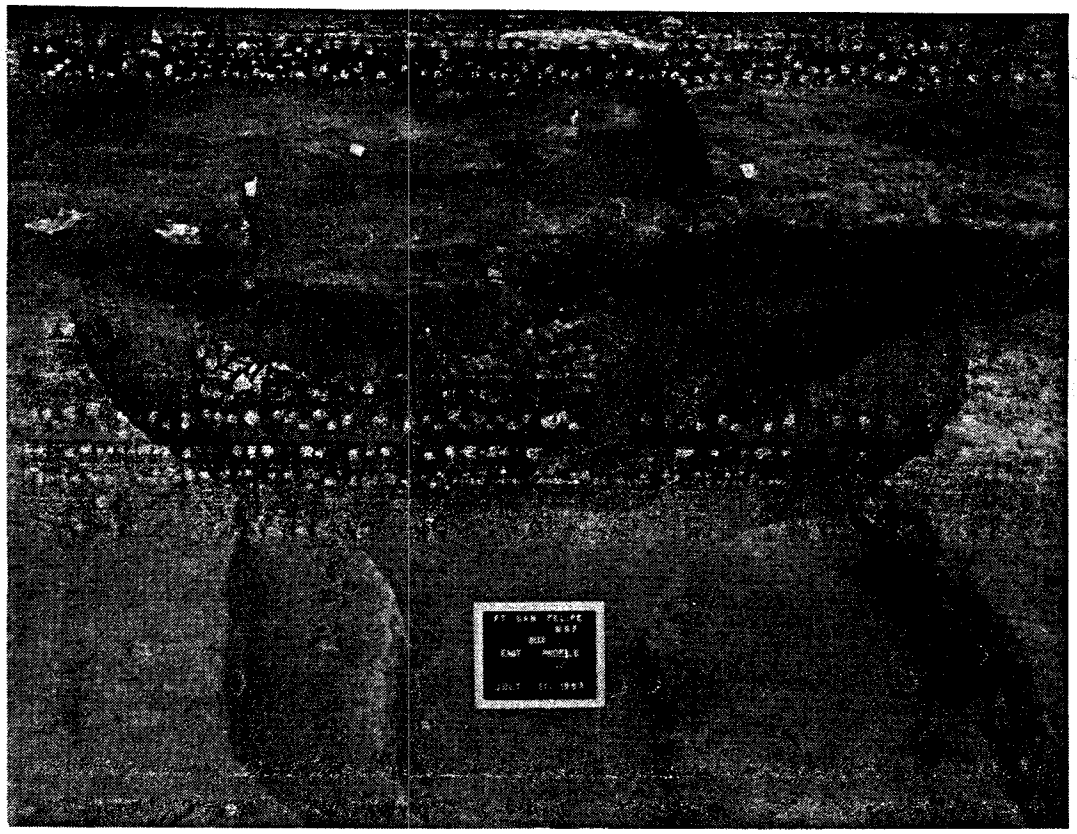


Figure 24. Profile of the casa fuerte posthole intruding into the pre-fort moat-like ditch of Feature 203. Note the relationship of the "smile" of burned faggots below the lime lumps around the second post.

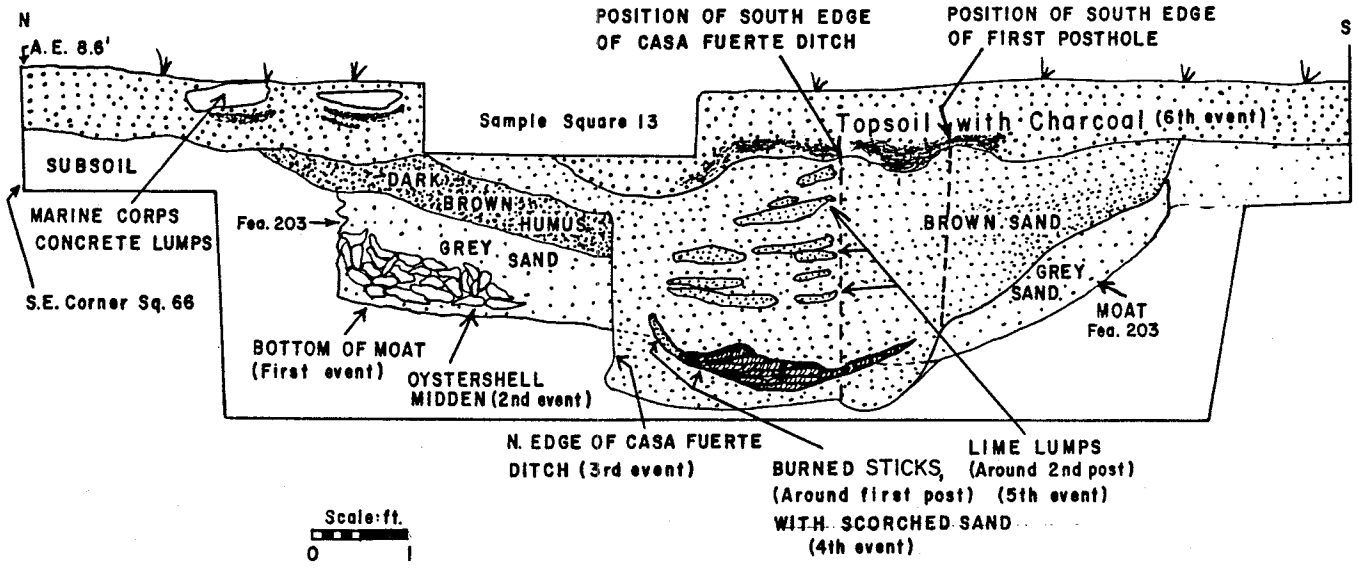


Figure 25. Profile drawing of the East profile of the casa fuerte posthole intruding into Feature 203 moat.

the profile. It was then that the casa fuerte ditch was excavated through this old moat feature, cutting six inches below the bottom of the moat into the subsoil beneath it, representing the third event.

The fourth event is represented by the layer of burned sticks at the bottom of the casa fuerte posthole that intruded onto the casa fuerte ditch that had been backfilled shortly after it was dug. As we have seen with other such intrusive casa fuerte postholes, the burned sticks likely reflect faggots placed around the first post in the hole, which burned in 1576, when the Indians burned Ft. San Felipe (Figs. 24, 25).

After the fire which produced the charcoal sticks in the bottom of the hole, some activity resulted in a layer of sand to cover the ashes and charcoal from the fire in the hole. This activity is thought to be the removal of the fire-scarred first post and the placement of a second post in the same hole. This second post was partially backfilled and then a layer of lime lumps was placed around the post, probably to sweeten the soil to retard rot. This second post placement and the lime lumps represent the fifth event seen in the profile.

The sixth event is represented by the topsoil zone above the features, which in this area, was heavily loaded with charcoal. A 10-foot square excavated just to the east of this profile revealed considerable burning at the bottom of the topsoil zone which may well be from Marine Corps activity in the area, since lumps of concrete and other evidence of twentieth century activity is seen in the topsoil zone (Figs. 24, 25). Further excavation is needed to determine the origin of this upper topsoil zone evidence for the burning of a structure on the site. Some evidence discovered in this 10-foot square suggests that the burning may be associated with the Spanish occupation, but Marine Corps activity seems to be the most likely origin.

Interpretive Summary of the Casa Fuerte Features

Before the Spaniards began to build their casa fuerte a moat-like ditch had been dug running in an east-west direction where they were to put the south wall of their fortified house (Fea. 203). This may have been some type of fortification feature or some non-military ditch, but not much more can be said of this feature until more of it is revealed through excavation further toward the east. Since we know from documents that the casas fuertes were completed by 1572, this moat-like feature with its erosional fill would date some time prior to that time.

The 50 by 70 foot ditch two and one-half feet wide and three and one-half feet deep below present ground surface was not laid out in a true rectangle, but was a parallelogram, having 86° and 94° corners. The ditches on the north and south ends continue on toward the east, and it is thought they connected originally to another structure the same size, since two casas fuertes were known to have been completed in 1572 (Hoffman 1978: 23; Lyon 1984). The question of importance is, what function did the ditch of this parallelogram shaped 50 by 70 foot structure serve?

It was begun after a fire in 1570, beginning in the powder room, destroyed the buildings within the ramparts of an earlier fort which Hoffman calls "Ft. San Felipe I (1566-1570)" (Hoffman 1978: 21, 23). The earlier Ft. San Felipe was located on a different site than the second Ft. San Felipe we are concerned with in this report. This information provides background for understanding the circumstances of the casa fuerte ditch in that it was constructed in a vulnerable position some 150 feet within the woods (600 ft. from the yet to be built Ft. San Marcos, which was 450 feet from the edge of the woods, as revealed by Figure 2 and Connor 1925: 267). Not being in open ground as Ft. San Marcos was built later, it was vulnerable to Indian attack, for as Marqués said, against Indians "there is no greater protection than the open country" (Connor 1925: 267). Thus exposed to possible attack during the time of its construction, there was a need for immediate protection during the period during which the casas fuertes were being constructed. If construction of the new Ft. San Felipe was begun shortly after the fire of 1570 burned the buildings in the old fort of that name, it took almost two years to complete the fortified houses not known to have been completed until 1572 (Hoffman 1978: 23).

With this need for protection during the construction of the casas fuertes, we now look at certain archeological data from this perspective. This brings us back to the casa fuerte ditch which was dug and then quickly backfilled. Something was no doubt placed in the ditch, either boards to form a curtain wall, or perhaps faggots, which we have seen, were specified to be from eight to nine feet long according to Ive (1589: 33-34). Guards were no doubt needed to defend against possible attack during the time the ditch was being dug. Since it took many months to gather wood for building the fortified houses on the site it may well be that faggots were placed, like palisades, in the ditch and backfilled to hold them in place as a protection during the construction of the blockhouses. Inner postholes for the nine "squares" inside the 50 by 70 foot casa fuerte area may well have been dug at this time since these were large, judging from that seen at Feature 148 (Figs. 6, 17, 18). The posts may well have been added to the holes much later in time after they had been prepared and brought to the site. Meanwhile, a dark humus soil lens accumulated in the bottom of the holes as seen in Figures 17 and 18. This might well account for the contrast between the humus lens accumulation in the posthole in Feature 148 (Fig. 17, 18), and the absence of such a lens in the ditch (Fea. 175) in Figures 15 and 16, which reveals the mottling associated with quick backfilling.

When the major posts were ready to be placed in the casa fuerte ditch large holes from three to four feet wide were dug into the ditch fill at the proper position. To do this the boards or faggots had to be removed in the area of the intrusive postholes, and after the post was positioned, faggots were placed around the post before it was backfilled, making the interior again relatively secure while the superstructure of the blockhouse was being built. This palisade of faggots, or boards, or poles formed a wall around the casa fuerte to protect the area inside from possible attack.

It was not until the moat and palisade and bastions for artillery were added around the casas fuertes at Ft. San Felipe two years later, in 1574 (Hoffman 1978: 23), that this "temporary" palisade of poles or faggots was

no longer needed. At that time, there was no longer a need for the palisade beneath the casa fuerte and they were likely removed, and used to build the ramparts of Ft. San Felipe. By thus removing the wooden contents of the ditch, no archeological evidence of the palisade wall ever having been there would be revealed. When the fort burned in 1576, the faggots around the posts burned down deeply into the posthole, producing the consistent burned stick, faggot "smile" seen in the casa fuerte postholes.

There are some problems with this "faggot fort at San Felipe" interpretation which is designed to account for these archeological data which showed virtually no evidence of architectural data within the ditch itself. Such an interpretation is based on a temporary defensive need, which is revealed by the ditch, with the need no longer being met once the outer moat, rampart, parapet, palisade and bastions were constructed in 1574. This interpretation assumes that any artillery at the site would have been placed behind such a faggot wall on the ground level beneath the second story of the casa fuerte. Other forts of the period, however, had artillery platforms for elevating the artillery above ground level and Ft. San Felipe's casas fuertes were probably no exception: Ft. San Marcos, for instance, and the wooden forts at St. Augustine had raised artillery platforms (Hoffman 1973: 9a; 1978: 27).

Also, the temporary use of faggots in the manner of palisades has no documentary foundation. The use of a board curtain wall, however, made of sawn lumber fastened to posts 18 inches apart set into a ditch virtually identical to that found at Ft. San Felipe was used at Ft. San Marcos (Hoffman 1978: 27; South 1980: 78-80). This pattern of a board wall facing the enemy may well have been in place above the casa fuerte ditch. However, why would such a sturdy wall have been removed when the earth and faggot ramparts of Ft. San Felipe were built in 1574? If they were not removed, thus continuing to enclose the ground floor of the two-story casa fuerte, the burning of the casa fuerte in 1576 would certainly have left some burned post remains somewhere in the ditch. This, however, was not the case, nor was evidence of rotten posts found, nor fired clay daub, nor oystershell mortar from wattle-and-daub wall construction. The ditch was simply backfilled against something which served a defensive function for a time, but which was subsequently removed, either at the time the large casa fuerte postholes were intrusively dug into the ditch by 1572, or when the moat, ramparts, parapet, palisade and bastions to the fort were constructed in 1574. The removal resulted in no sign of their presence being observed archeologically, in spite of careful efforts to observe such data had it been present. Thus, the interpretation given is as close as we can come at this time to accommodating the archeological facts with the historical documentation. When the remaining half of the casa fuerte is excavated perhaps new data will emerge to reveal new insight into the interpretation of the casa fuerte within Ft. San Felipe.

As always the archeological record is a complex one, reflecting a number of behavioral events, for some of which there survives historical documentation as an aid to interpretation. No documentation is known for the rebuilding of the casa fuerte during the period of the second Santa Elena, after its burning in 1576. There is no doubt, however, that such rebuilding of the blockhouse took place, since the archeological record is positive on this point. It has also provided us with valuable details of

the size and shape and details of construction we did not know about prior to the excavation. In the next section we will examine those archeological features external to those we have just seen for the casa fuerte, but associated with it as part of Ft. San Felipe.

Archeology - The Fort San Felipe Features

The Moat

Along the west edge of the 30 by 120 foot area from four to six feet of the inside edge of the moat of Ft. San Felipe was seen (Fig. 6). The moat around the northwest bastion was found to be from 16 to 17 feet wide, but along this west curtain of the fort it is apparently 25 feet wide. However, 40 feet from the south end of the 30 by 120 excavation area the inside edge of the moat makes a right angle turn toward the west, perhaps narrowing down here to the 16-foot width seen elsewhere. Total excavation of the west curtain moat of the fort will be necessary to understand why there is this variation in moat width along the west curtain.

Excavation of the moat was not part of the plan of this project, but two sections were taken at 202A and 202B for use as a guide when the moat excavation project is undertaken in the future. At the surface of the moat fill burned areas were observed, resulting from the falling of burning timbers from the adjacent palisade into the moat when the fort was burned in 1576. The linear nature of these burned areas along the inside edge of the moat suggests that burned timbers and palisades will be found within the moat lying in jackstraw fashion as was seen in the moat at the northwest bastion (Fig. 6), (South 1983).

The Palisade Ditch

Part of a palisade ditch with burned post remains and scorched soil from burning of the palisade posts was found along the inside edge of the moat at a distance of from two to three feet from it. Only 23 feet of the palisade was seen along the inside edge of the west curtain of the moat, and 10 feet along the inside of the north curtain moat. These are shown in relation to each other by means of an interpretive line in Figure 6. The palisade ditch was shallow at the level of examination below the topsoil zone and care had to be exercised so as not to schnit out the bottom of the ditch. The remaining fragments of charcoal posts and scorched sand areas within the ditch were no larger than four-tenths of a foot, with some being smaller, suggesting that small posts, possibly woven with withes, "in the manner of gabions" may have been used to stabilize the palisade so that earth from the ditch could be thrown behind it in a manner shown in Figure 12. However, such a rampart of sand faced with turf and bonded into shape with faggots would have been no wider at the base than seven to eight feet, the distance from the palisade to the casa fuerte ditch. The narrowness of this distance suggests that the earth from the moat would have made a narrow rampart and parapet and was, perhaps, thrown against the wall of the casa fuerte.

The Wells

In the 1981 excavation season at Santa Elena a wooden barrel used to line a well was recovered from a well at Santa Elena (South 1982: 111). It was found in this project that a layer of white sand lay at a depth of about five feet below the surface of the ground beneath the site of Santa Elena. When the well was excavated and two barrels placed in the hole as a well shaft, and then backfilling carried out, some of the white sand was thrown into the area around the well shaft, producing a white crescent-shaped area around the central humus-filled barrel shaft. A feature with a white crescent around a darker center, therefore, is indicative, at Santa Elena, of a hole that has been dug at least to a depth of about five feet, in which case it is likely a well, with white sand thrown around a central barrel shaft as backfill to the well hole.

Well Feature 146

Three such features were discovered inside Ft. San Felipe. The first to be discussed here is Feature 146, which contained a mass of oystershell midden at the top. At the four-foot depth the characteristic white sand lens around the central shaft was seen and excavation was stopped until adequate funding was available to completely excavate the well. The fact that this well, containing Spanish majolica, iron objects and other artifacts, was filled with oystershell midden revealed that it was abandoned as a well prior to the time the Spaniards abandoned Santa Elena and Ft. San Felipe in 1576, when the Indians burned the fort, and finally, in 1587, when the final abandonment of Ft. San Marcos and the city took place (Hoffman 1978; Connor 1925; Lyon 1976, 1984; Ross 1925).

The documents indicate that two wells were dug inside Ft. San Felipe by 1572, and it is thought that this is one of those wells, located at the southwest corner of the casa fuerte (Lyon 1984), (Figs. 6, 26). Since this well shaft is apparently filled with Spanish subsistence debris, it is considered one of the most important features in Ft. San Felipe for the recovery of faunal and plant data on Spanish foodways inside the fort.

Well Feature 217

Well Feature 217, at the northwest corner of the casa fuerte, is considered to be a mate to Feature 146, being located at a similar position at the west corner of the casa fuerte structure (Fig. 6). This well, excavated to a depth of three feet, contained a large quantity of wrought nails in the central fill area as well as large fragments of green basin ware and majolica. Further excavation will be carried out as funding is made available for carrying out a detailed examination of this feature. It may well have been abandoned when the fort was abandoned since no sign of intentional filling could be seen.

Well Feature 172

The third well feature was #172, located only five feet north of Feature 146, the midden-filled well. It is thought that this well is a replacement well for Feature 146. When Well 146 was abandoned and began to

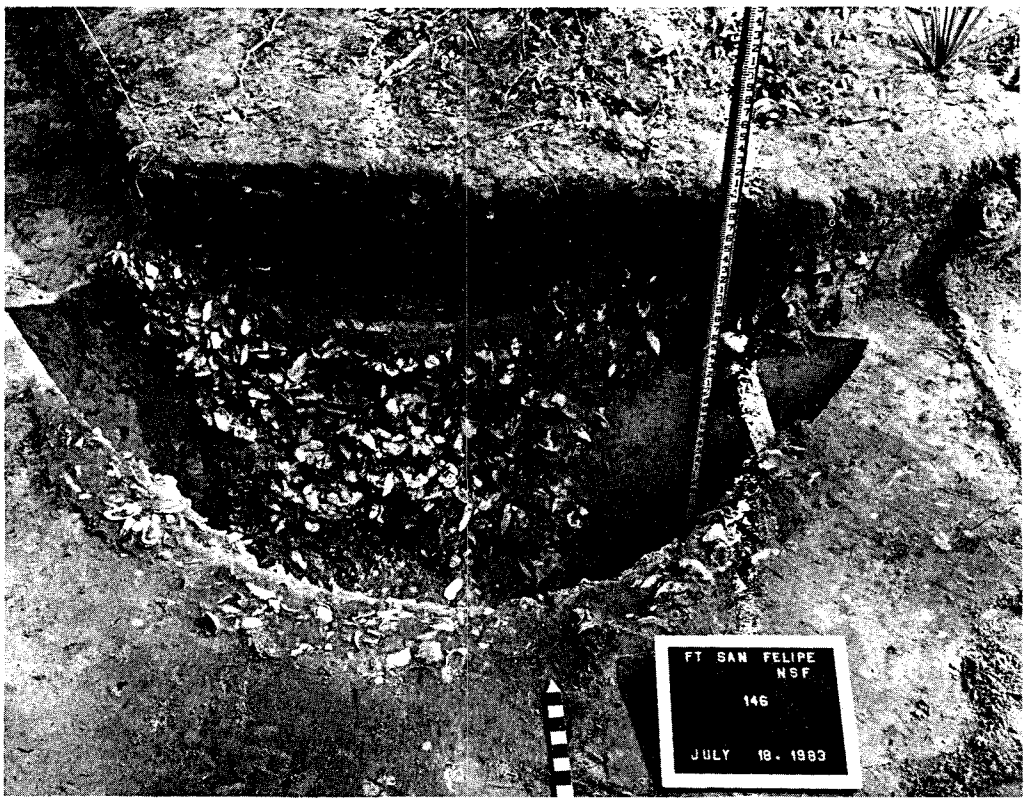


Figure 26. Profile of the midden-filled Well #146 beneath the pine tree. Note that only a sample of the well fill was taken.

be used as a midden deposit, this new well was dug and served as a replacement for Well 146, for water for the soldiers in Ft. San Felipe's casas fuertes (Fig. 6). This well may have been used until the abandonment of Ft. San Felipe since it, too, contains no evidence of having been used as a refuse deposit for oystershell midden. It was used, however, for depositing a mass of lime mortar 1 1/4 inches thick from some structure, probably postdating the 1576 abandonment of Ft. San Felipe, and during the period of the rebuilt casa fuerte. These lumps of mortar with flat surfaces on both sides of the 1 1/4-inch thickness were not found in the postholes for the rebuilt casa fuerte dating after the importation of lime from Cuba after 1577. This artifact is relatively rare inside Ft. San Felipe and is likely from structures built after 1577 when the casa fuerte was rebuilt and the houses in the second Santa Elena were constructed. The presence or absence of this type lime mortar, lime lumps, and oystershell mortar will be critical interpretive variables to analyze in future projects on this site. An NSF grant has been received for excavation of the remainder of Ft. San Felipe and these three wells during the 1984 field season.

Interpretive Plan of Fort San Felipe at Santa Elena

The work described above and that carried out in previous seasons of work has determined that half of Ft. San Felipe has washed away through erosion of the eastern edge of the site during storms and daily tidal action. A major question of concern is the relationship between the 50 by 70 foot casa fuerte discovered and partially examined in the NSF project of 1983, and a second casa fuerte known to have been inside the fort. Using the information from the surviving half of the fort, and interpolating to the missing half, we have addressed this question. The question we are asking is whether two such 50 by 70 foot casas fuertes could be seen to fit inside an interpolated Ft. San Felipe.

By using the distance of 200 feet from the outside of the northwest bastion to the southwest bastion (Fig. 2), we can suggest that no greater distance than 200 feet should be interpreted for the distance from these bastions to the outside of the easternmost bastions of the fort.

The second step is dealing with the outward trending direction of the north and south moats of Ft. San Felipe as seen in Figure 2. This configuration certainly does not suggest a triangular fort or a square fort, but rather, a trapezoidal shape. Using the existing northwest bastion as a model we can then extend the north and south moats toward the east to a point where the distance from a reconstructed fort is 200 feet from east bastion to existing west bastion. When we do this we have the shape and size of Ft. San Felipe appearing as that seen in Figure 27.

By taking the distance from the west ditch of the casa fuerte to the edge of the moat (10 feet), and using that same distance from the easternmost moat of the interpretive drawing of Ft. San Felipe, we find that two casas fuertes can indeed fit inside the fort in a connected manner, with twenty feet between them. We know that the two casas fuertes may well not have been arranged in this manner, but we have no alternative but to suggest this arrangement based on these data for the casa fuerte ditch seen in Figure 6, which shows the ditch continuing on toward the east at the northeast corner of the casa fuerte. By using the information seen in Figure 6 relative to the palisade ditch around the inside edge of the moat we arrive at a conjectural position of it within the fort as seen in Figure 27. From this interpretive plan we have determined that the 50 by 70 foot casa fuerte we have found might well have had a twin or even a much larger structure inside the eastern half of the fort. It is apparent that we are dealing with no small structure, but one that measures the length of a football field along diagonal corners: a fort "of wood, faggots, and earth" of impressive dimension!

In regard to the trapezoidal shape of the fort as seen here (Fig. 27), it is interesting to note that a similar shape is seen in the plan of a fort at St. Augustine dating from ca. 1593 (Fig. 28), (Robinson 1977: 16). The broad side of Ft. San Felipe, facing the water, makes a lot of sense in that in this manner more fire power could be directed against the direction from which European enemies would most likely attack. When the fort was abandoned, however, the enemy had come, not from the sea, but from the landward side in the form of 500 Indians with bows and arrows. For many

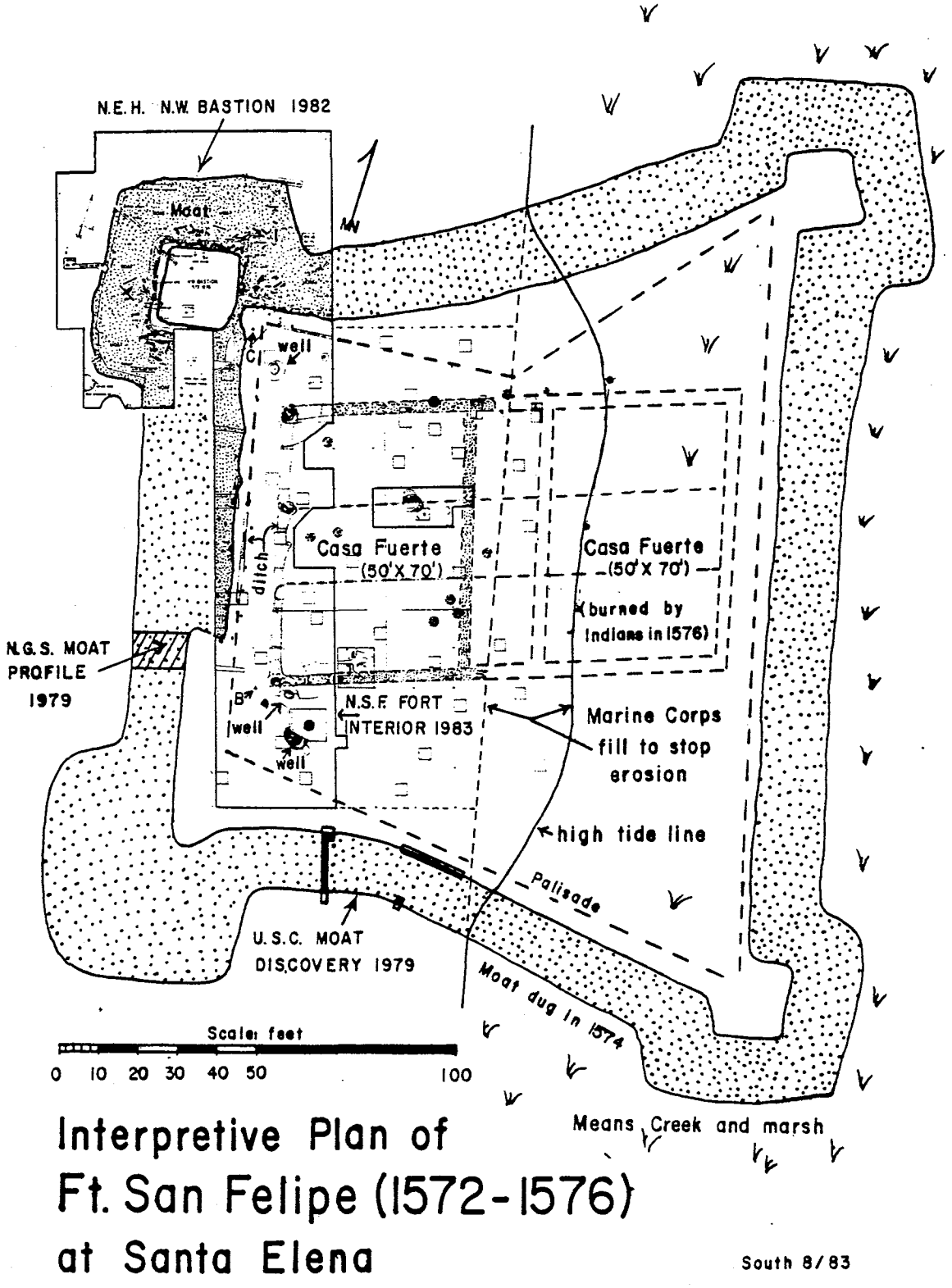


Figure 27. Interpretive plan of Fort San Felipe at Santa Elena showing the position of the two casas fuertes known to have been inside the fort.

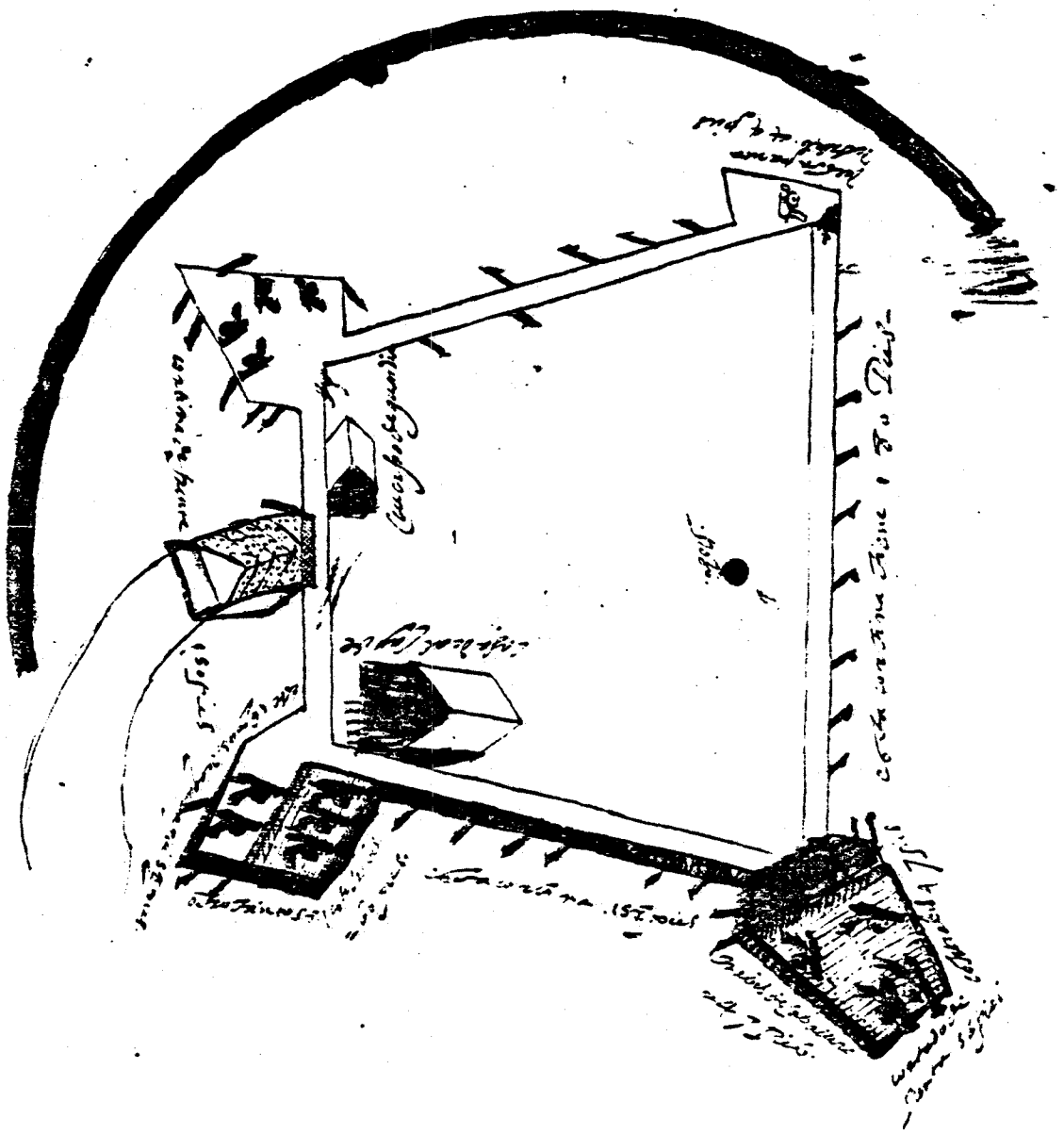


Figure 28. Drawing of a fort in St. Augustine (ca. 1593), having a plan similar to that at Fort San Felipe seen in Figure 27 (Fuerte Biejo que Está en San Augustin, Florida. Archivo General de Indias, Seville, from Robinson 1977: 16).

more years to come the Spaniards would face this enemy before they would finally abandon Santa Elena, to release an important toe-hold on the American Continent.

ARTIFACT ANALYSIS - TESTING ARCHEOLOGICAL METHODS

Classification

The classification of the classes of artifacts from Santa Elena has been discussed in some detail elsewhere (South 1982: 45-62, 1983: 23-25), so no specific discussion of these will be repeated here. However, some artifacts recovered in the 1983 season of work inside Ft. San Felipe were unique and these will be discussed and illustrated here.

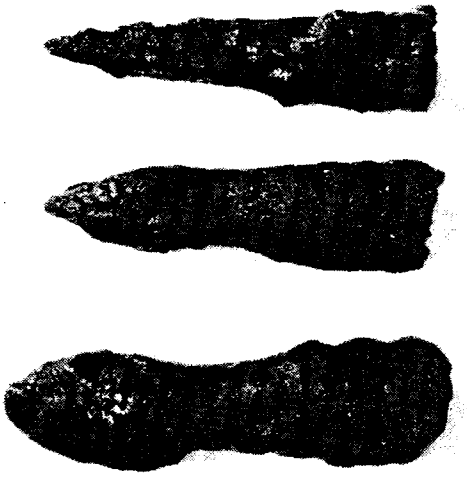
The major artifacts, as usual, were Spanish olive jar, majolica, earthenware, and contemporary Indian pottery. The relationship of these to other artifacts will be discussed in the quantitative analysis section of this report. Some interesting military objects were recovered in the fort, as might be expected. Among these were two cannonballs, three crossbow bolt points (Fig. 29B), and a brass serpent head, probably from the serpentine of a matchlock musket, the part that held the match (Fig. 29A).

An octagonal one-hole brass gorget, such as seen on Indian sites of the contact period (Polhemus 1982) was also recovered and may have been made at Santa Elena as an Indian trade item (Fig. 29C). It has a diameter of 47 mm, with a central hole 3 mm, and a thickness of 1 mm. A square bone awl with an iron shaft was found in the fill of the casa fuerte ditch. This, and a bone awl from the moat fill may also have been items made by Indians rather than the Spanish (Fig. 29D). The brass gorget with a central hole is like those seen in Tennessee and Georgia from Indian contexts of the early historic period. These are found in Dallas contexts and in some cases Spanish beads are found with them, dating them to ca. 1570 to 1600. Richard Polhemus reports on 17 of these from East Tennessee in a recent study (Polhemus 1982).

An interesting class of personal ornament, apparently made of ebony, with a drilled mounting hole, probably to be sewn onto garments were found in Ft. San Felipe features. They measure about 1 cm and are delicately carved into a square motif (Fig. 30A), a trilobed motif like one found in a previous season (South 1982: 52, 59), (Fig. 30C), and a figa or triple clenched fist ornament (Fig. 30B). This latter object was believed to provide protection against the evil eye and were used in Spain since Renaissance times until the present in Latin American countries (Catalogo de la collection de amuletos. En trabajos y Materiales del Museo del Pueblo Espanol, Madrid: Talleres Tipograficos "AF", n.d.: 16-18. Reference 11/7/1983,. courtesy of Kathleen A. Deagan). Similar figas have been found in eighteenth-century contexts in St. Augustine (Kathleen A. Deagan, personal communication). This is the only one known from a sixteenth-century archeological context and is unusual in that it is a triple figa, whereas most are single hands.

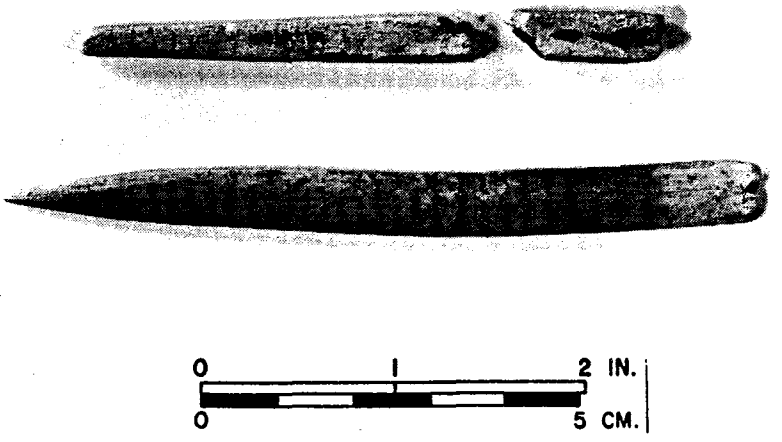
Copper wire bordado, a braid sewn onto upper-class gentlemen's clothing has been found in Santa Elena (South 1982: 55-57) in previous seasons

A - 38BU162G-59A (10' Square).



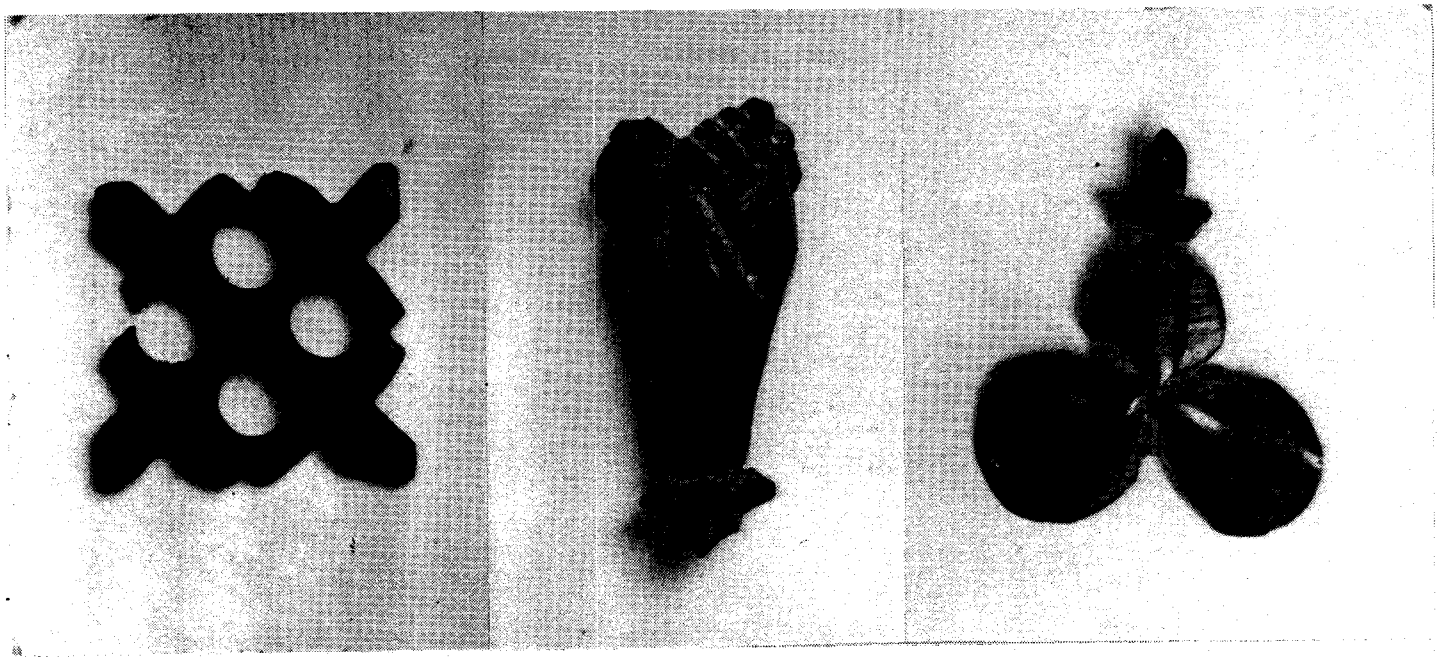
B - 38BU162G-63A (10' Square)
38BU162G-18A (3' Square)
38BU162G-67A (10' Square)

C - 38BU162G-14B
(Midden-filled well)



D - 38BU162G-225 (Fill of casa fuerte ditch)
38BU162G-202B (Fill of Fort San Felipe moat)

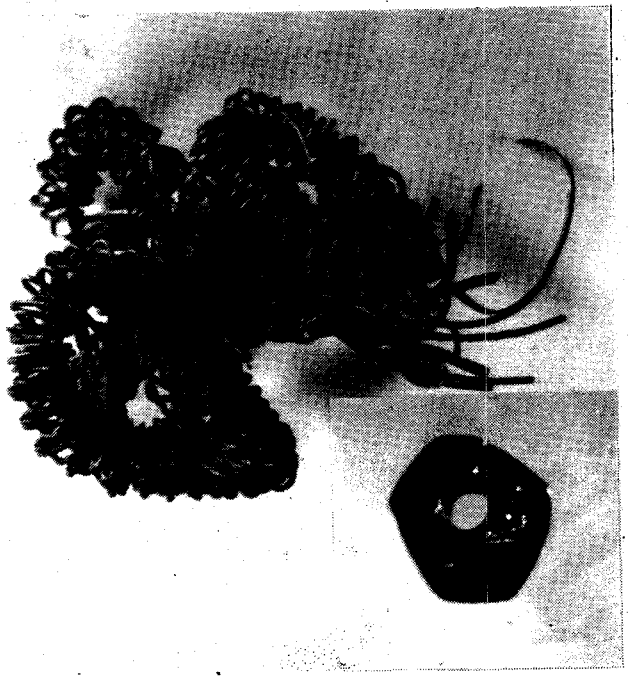
Figure 29. A brass serpent head, probably from a matchlock musket, crossbow bolt points, a one-hole brass gorget, and bone awls from excavation inside Fort San Felipe.



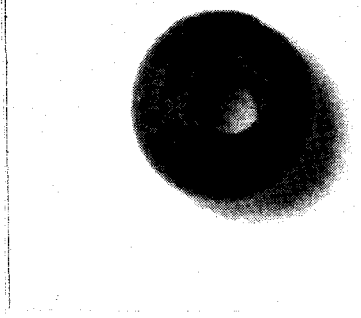
A - 38BU162G-225
(casa fuerte ditch)
Clothing ornament

B - 38BU162G-241A
(above well 146)
Figa ornament

C - 38BU162G-147
(midden pit)
Ornament



E - 38BU162G-198
(casa fuerte posthole)
Bordado and garnet bead
(bead not to scale)



D - 38BU162G-146A
(midden-filled well)
Glass bead

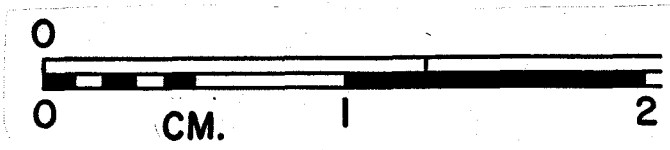


Figure 30. Clothing ornaments, bordado and beads from Fort San Felipe.

of work and a quantity was found in casa fuerte posthole #198 (Fig. 30E). An unusual feature of this bordado, however, is that a faceted garnet bead was found attached to it. An enlarged view of this bead is seen beside the bordado in Figure 30E. This bead, and a round one (Fig. 30D), and a fragment of a third from the midden-filled well #146A are the only Spanish-made beads yet found in Spanish context in Santa Elena. These beads are discussed by Richard Polhemus in Appendix II. It is interesting to note that the bead fragment is made of amber.

Quantitative Analysis of Intrasite Data

SYMAP

Goals

In 1979 a 1% sample was taken of a 90 by 420 foot research frame in a stratified systematic unaligned subsurface sampling procedure (South 1979: 17-22). This sample amounted to one three-foot square in each 30 foot square area and the west half of Ft. San Felipe. The result was two areas of concentration of Spanish pottery, and other artifact classes were shown inside the fort area. A goal of the 1983 National Science Foundation project was to compare a 3% stratified systematic unaligned subsurface sample with the 1% sample shown on the SYMAP projection from the 1979 study. This was to be compared with a totally excavated area of 30 by 120 feet inside the west edge of the fort. By so doing, the degree of predictability of the 1% sample and the 3% sample in relation to the SYMAP projection of data from the totally excavated area could be seen.

Method

A table of random digits (Hoel 1966: 327) was used to select coordinates for the placement of a three-foot square in each 30 foot square in a 60 by 120 foot area. Three such sets of coordinates were selected, resulting in three squares in a 30 foot square area, or 3% of the area. The squares so positioned were then assigned provenience numbers, and angles and distances from reference point B were determined and then shot with a transit in the field (Figs. 3, 6). The details of the procedure are outlined in an earlier section of this report dealing with research methods.

Sherd counts for Spanish pottery and Indian pottery and weight in grams for fired clay daub were programmed for SYMAP (Dudnick 1971), for the three-foot sample squares in a 60 by 120 foot area and the 10-foot squares in the totally excavated 30 by 120 foot area. The SYMAP display for all sherds over 20 for Spanish and Indian pottery was used for the three-foot squares and over 200 sherds for the 10-foot squares of the totally excavated area. The weight of fired clay daub in the three-foot squares above 20 grams was used and in the 10-foot squares over 100 grams was displayed. These data are shown in Figures 31-33.

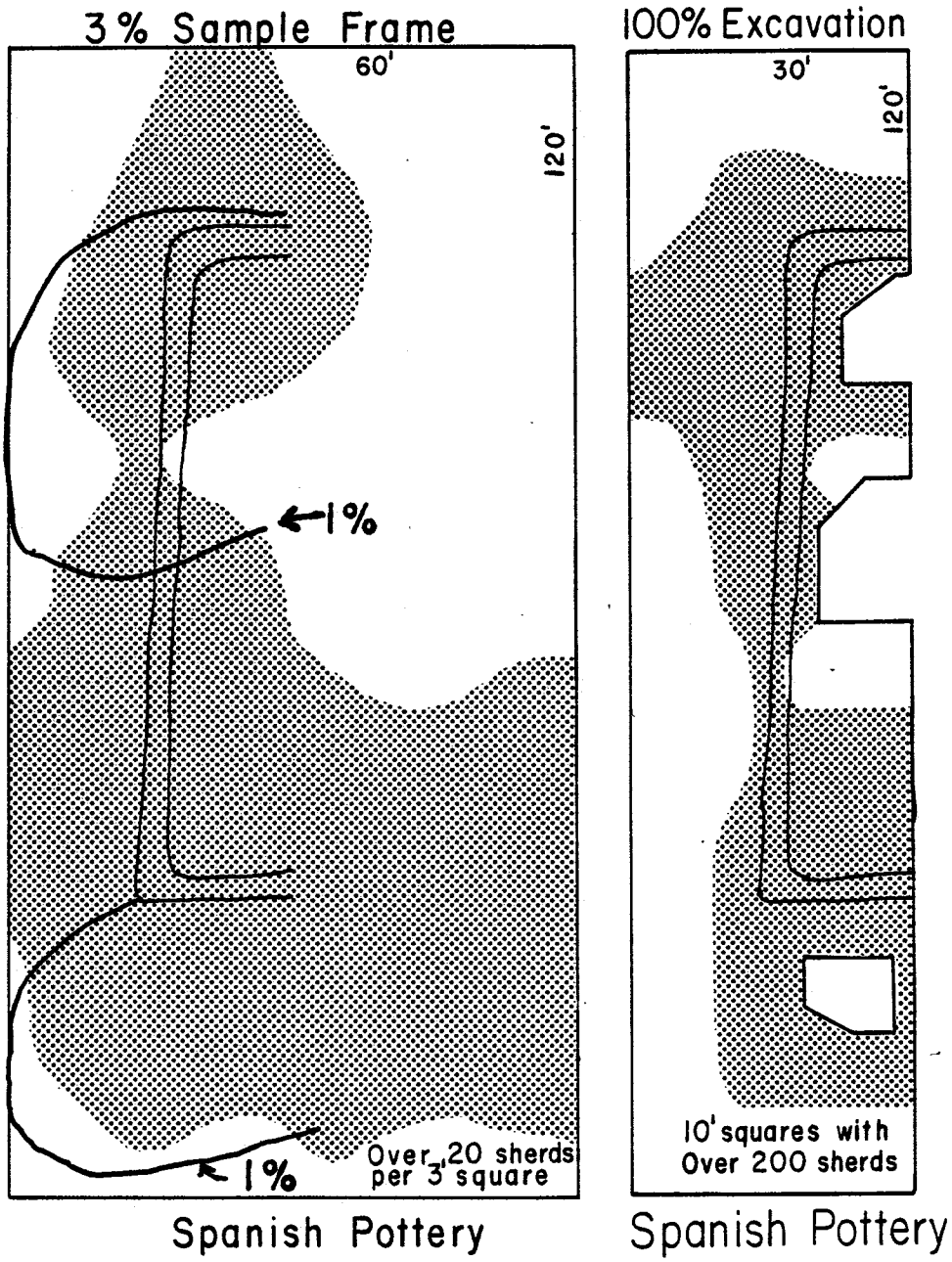


Figure 31. Comparison of Spanish pottery dispersion from 1% and 3% samples with a totally excavated area inside Fort San Felipe.

Spanish Pottery

In Figure 31, the comparison of the 1979 1% sample with the 3% sample of 1983 is seen for Spanish pottery. The 1% sample revealed two clusters of Spanish pottery, one at the northwest corner of the casa fuerte and one at the southwest corner. The totally excavated area also revealed a similar concentration at these corners of the casa fuerte structure. The 3% sample was more predictive of the concentration of Spanish pottery in the archeological universe than was the 1% sample. However, the 1% sample did indeed reveal two major areas of concentration of Spanish pottery as seen in the SYMAP of the total excavation. It is concluded, therefore, that the 3% sample provides a close approximation of the dispersion of Spanish pottery within Ft. San Felipe.

Indian Pottery

The dispersion of Indian pottery (Chicora), (South 1973), as revealed by the 3% sample, revealed three areas of concentration, with two of these being over the area of the casa fuerte (Fig. 32). The full excavation produced a SYMAP showing the major concentration of Indian pottery just west of the northwest two-thirds of the casa fuerte. The 3% sample suggests a concentration of Indian pottery along the west half of the 60 by 120 foot sample frame and this is supported by these data from the 100% excavated 30 by 120 foot area (Fig. 32). When the eastern 30 by 120 foot area remaining inside the fort is excavated, this comparison can be better made. By comparing Figures 31 and 32, it can be seen that the contemporary Indian pottery was being discarded along with Spanish pottery in a similar refuse disposal pattern. Data for the three-foot and ten-foot squares are seen in Appendices III and IV.

Fired Clay Daub

From the 3% sample, fired clay daub from burned structures appears to cluster in three areas, the largest being at the northwest corner of the casa fuerte (Fig. 33). The totally excavated area also reveals three clusters in the same area of fired clay daub, with a major concentration, again, at the northwest corner of the casa fuerte. The 3% sample appears to be predicting relatively well the dispersion and density of fired clay daub found in the archeological universe. The 3% level seems to be an adequate one for projecting from a sample to the universe at Ft. San Felipe. Fired clay daub weights used in the SYMAP projections are seen in Appendix XIII.

Summary

From the use of SYMAP analysis of the dispersion of artifact classes, it is apparent that there is a clustering at the corners of the casa fuerte structure. This can be understood when we examine the architectural relationship between the casa fuerte, the palisade, the moat, and the wells (Fig. 6). There is little space available at the central west end of the casa fuerte for disposal of refuse, whereas around the wells #217 and #146 there is space for such activity, and it is in these areas that Spanish pottery and contemporary Indian pottery fragments were thrown on the site.

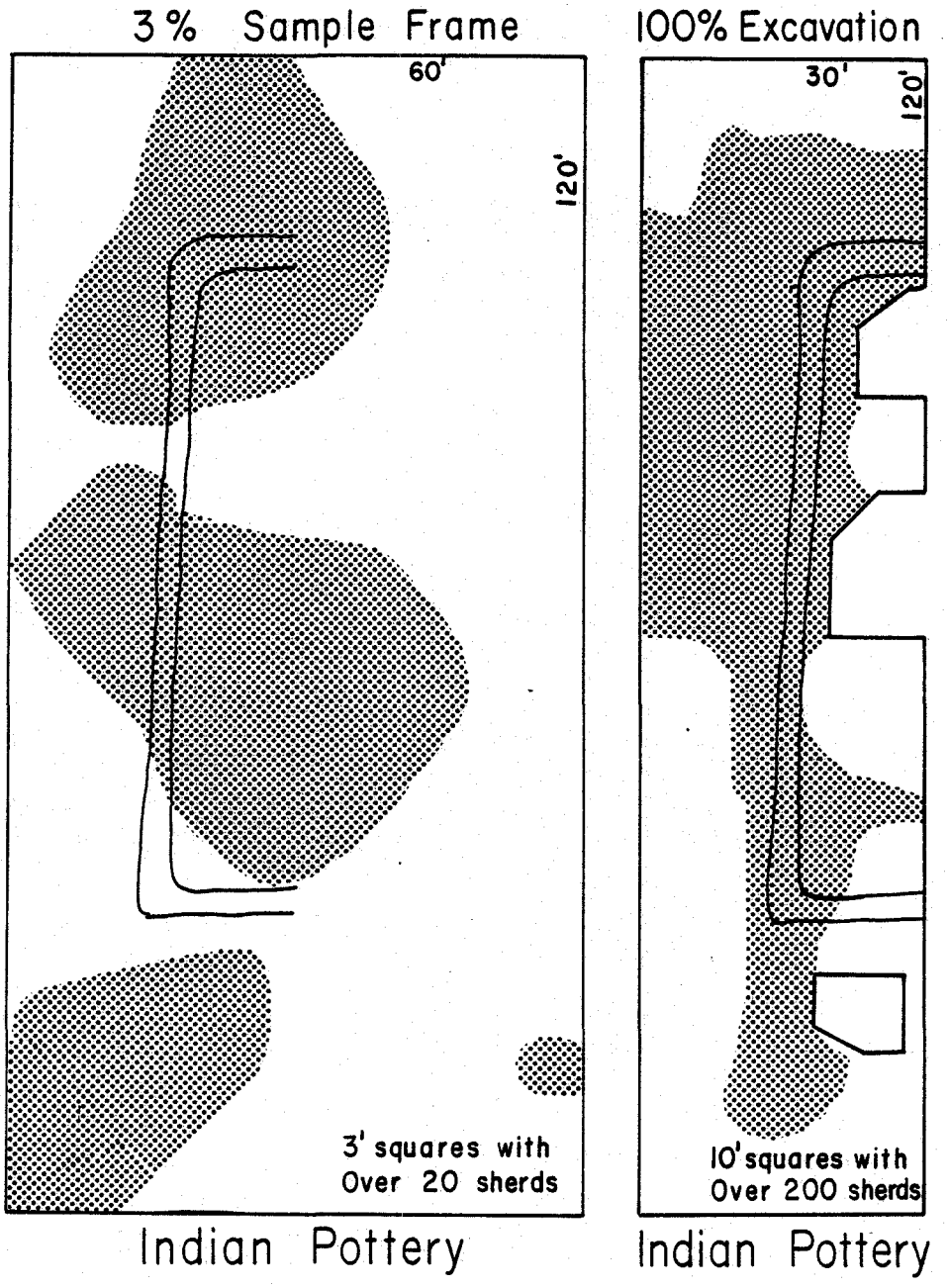


Figure 32. Predicted dispersion of Indian pottery from a 3% sample compared with a totally excavated area inside Fort San Felipe.

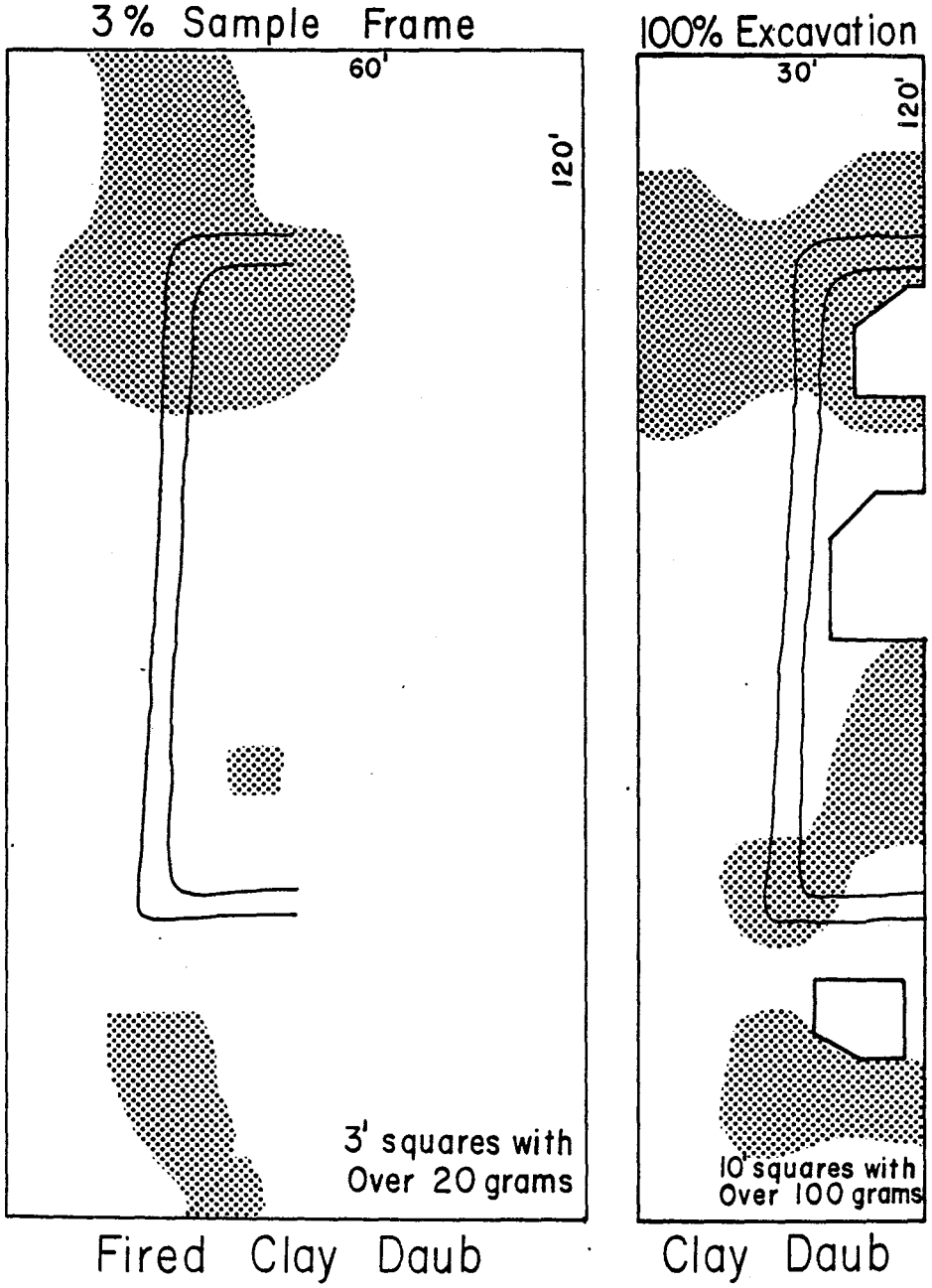


Figure 33. Fired clay daub dispersion from a 3% sample compared with that in a totally excavated area inside Fort San Felipe.

The SYMAP displays for the pottery classes reflect this double refuse disposal pattern, from the 1% and 3% samples as well as in the totally excavated area. In the totally excavated area there is a clear tendency of SYMAP data to cluster within the area defined by the palisade wall (Figs. 31-32), a situation to be expected, but it is rewarding to see it so clearly correlating with the palisade line and the use of space at the corners of the casa fuerte structure.

The Carolina Pattern Artifact Analysis

Fort San Felipe Artifacts

The artifacts from historic sites can be organized into types, classes and groups according to what I have called "The Carolina Pattern" model of artifact relationships (South 1977: 82, 1982: 62, 1983: 25, 63). This allows various groups and classes of artifact types to be examined quantitatively for discovering patterns reflecting various culture processes, such as status, function, ethnicity, etc., as well as a means of comparing results of various sampling levels. This is seen in Table 1, with the specific artifact types and classes from which this table was drawn being seen in Appendices VII-X.

From Table 1 we can see that the Kitchen Group of artifacts, which includes Spanish pottery, is equally divided with aboriginal (Indian) artifacts, primarily pottery, these two groups comprising 97.61% of all artifacts, a situation, as we shall see, typical of artifact assemblages at Santa Elena. Table 1 also allows us to compare the artifacts from the three-foot sample squares with those from the ten-foot squares from the total excavation of the 30 by 120 foot area. Here we see that rather than being equal, there is a higher Kitchen to aboriginal group artifact ratio in the three-foot squares (58.38 Kitchen to 38.69 Aboriginal). This may be a function of sample size.

One of the most interesting observations to be seen in Table 1 is the difference seen between those features screened through 1/4" screen and those on which a 1/8" screen was used. Some eight features were suspected of containing valuable faunal and floral data for analysis and so 1/8" mesh screen was used on these. Eighteen other features were screened through standard 1/4" screen. Note that the Clothing Group of artifacts is more than ten times greater in the 1/8" screen sample than with the 1/4" screen sample (Table 1)! This comes from 37 brass pins and 14 aglets (lacing tips) recovered using a 1/8" screen, while only 4 brass pins and 2 aglets were found using a 1/4" screen (Appendices IX and X). This difference in screen size has greatly influenced the counts of artifacts and thus their percentage relationship. This obvious methodological variable limits the cultural interpretations that can be made from the assemblages on a comparative basis.

TABLE 1

COMPARISON OF ARTIFACT GROUPS FROM FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL

ARTIFACT GROUP	A/B Level 3 ft. sqs. 1/4" Screen Count	%	A/B Level 10 ft. sqs. 1/4" Screen Count	%	Spanish Features 1/8" Screen Count	%	Spanish Features 1/4" Screen Count	%	Site Total Count	%
KITCHEN	1,035	58.38	7,920	48.30	343	56.79	200	32.42	9,498	48.97
ARCHITECTURE	34	1.92	179	1.09	38	6.29	36	5.84	287	1.48
FURNITURE	-	-	-	-	-	-	-	-	-	-
ARMS	18	1.01	47	.28	1	.17	7	1.13	73	.38
TOBACCO PIPE	-	-	3	.02	-	-	-	-	3	.02
CLOTHING	-	-	3	.02	67	11.09	6	.97	76	.39
PERSONAL	-	-	12	.08	5	.83	3	.48	20	.10
ACTIVITIES	-	-	4	.02	-	-	-	-	4	.02
TOTAL ABORIGINAL	686	38.69	8,232	50.19	150	24.83	365	59.16	9,433	48.64
	1,773	100.00	16,400	100.00	604	100.00	617	100.00	19,394	100.00

Fort San Felipe Artifacts Compared with Domestic Santa Elena Artifacts

By using the Carolina Pattern model we can compare artifact group percentage relationships between domestic Santa Elena and the area inside Ft. San Felipe. To do this we have combined the artifact totals from the three-foot sample squares with those from the ten foot squares in the totally excavated 30 by 120 foot area inside Ft. San Felipe. We have also compared these figures to those data from the moat fill at the northwest bastion of Ft. San Felipe. This comparison of intrasite data is seen in Table 2.

The primary comparison of interest in Table 2 is that between the Kitchen Group artifacts and those aboriginal, Indian Activities Group artifacts (mostly pottery). These have been placed side-by-side at the bottom of Table 2 for easier comparison. Those data from the 1981 season and those from the 1982 season are very similar, with Kitchen Group artifacts being slightly higher than the Indian Activities Group. The Ft. San Felipe data, however, shows identical percentages, with slightly over 49% of all artifacts being from each of these two artifact groups. It should be noted that the remains of Architecture Group artifacts inside Ft. San Felipe is only one-fourth that seen in the assemblages in domestic contexts at Santa Elena.

Another dramatic difference seen in Table 2 is in the Arms Group artifacts, with those from Ft. San Felipe being far less than that group from domestic contexts at Santa Elena, the opposite of what one might have expected the case to be. This may well relate to the better curation of artifacts such as musketballs by the military inside Ft. San Felipe than within a civilian context. Also, many of the soldiers from the fort are known to have been billeted in Santa Elena rather than in the fort (Paul Hoffman, personal communication 8/24/1983); nevertheless, there was found within Ft. San Felipe considerable evidence of subsistence activities in the form of domestic refuse in much the same relationship as seen in Santa Elena. More will be said of this later.

The most dramatic contrast between these data seen in Table 2 is that from the northwest bastion of Ft. San Felipe compared with the other assemblages from Santa Elena and from inside Ft. San Felipe. The northwest bastion sample was heavily loaded toward Indian activities, as seen in the 80.46% of such artifacts recovered. This phenomenon caused us to suggest a "military pattern" vs. a "domestic pattern" within Santa Elena (South 1983: 72). What we have found, however, is a pattern inside the fort that differs from that at the northwest bastion that is more compatible with the relatively equal ratio seen in Santa Elena's domestic contexts. This means that similar behavioral patterns relating to kitchen and Indian artifact producing activities were present in the town and are revealed at this level of data manipulation. What is the explanation for such a high Indian pottery to Spanish artifacts at the northwest bastion when there is virtually an equal ratio inside the fort? One way of monitoring this phenomenon would be to examine feature data and other assemblages for similar patterns. We will return to this mystery later.

TABLE 2

ARTIFACT GROUP COMPARISON FROM THE B ZONE IN SANTA ELENA
WITH THE A AND B ZONES IN FORT SAN FELIPE

Activities Group	SANTA ELENA 30' BY 100' Area 1981 BU162C B Level		SANTA ELENA 20' by 30' Area 1982 BU162D B Level		INSIDE FT. SAN FELIPE 3' Sample Squares and 10' Squares (30' by 120' area) 1983 BU162G A & B Levels		N.W. BASTION MOAT FT. SAN FELIPE Layers C, D, E 1982 BU162E Moat Fill	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
KITCHEN (Domestic)	4,474	47.00	1,377	50.51	8,955	49.28	1,023	15.21
ARCHITECTURE	382	4.00	112	4.10	213	1.17	212	3.15
FURNITURE	6	.06	1	.04	-	-	3	.04
ARMS	94	1.00	80	2.93	65	.36	56	.83
TOBACCO PIPE	8	.08	2	.07	3	.02	-	-
CLOTHING	5	.05	1	.04	3	.02	4	.06
PERSONAL	1	.01	1	.04	12	.06	1	.01
ACTIVITIES (Spanish)	485	5.10	32	1.18	4	.02	16	.24
ACTIVITIES (Indian)	4,068	42.70	1,120	41.09	8,919	49.07	5,411	80.46
ARTIFACT TOTAL	9,523	100.00	2,726	100.00	18,173	100.00	6,725	100.00
KITCHEN		47.00		50.51		49.28		15.21
ACTIVITIES (Indian)		42.70		41.09		49.07		80.46
OLIVE JAR RATIO TO ALL ARTIFACTS		33.4		32.9		22.85		7.02

Another means of comparing artifact classes is to compare one class such as olive jar fragments to all other artifacts to obtain an olive jar ratio (Goggin·1960). We have done this at the bottom of Table 2 by dividing the total artifact count into the total olive jar count. This allows us to see the relative presence of olive jar fragments in various assemblages. Using this means of monitoring olive jar fragments we see that the samples for 1981 and 1982 within Santa Elena are much the same, whereas it drops 10 percentage points in the assemblage from inside Ft. San Felipe. These most dramatic data, however, come from the northwest bastion of Ft. San Felipe, where the olive jar ratio is 7.02, several times less than that from other contexts in the fort and in the town. This parallels the drop at the northwest bastion in Spanish Kitchen Group artifacts.

Olive jars were used for storage of oil and other liquids, and by establishing the normal relationship between this pottery type and other artifacts in Santa Elena domestic contexts we have a base against which to compare various assemblages. From the olive jar ratio in Table 2 we can see that the domestic norm within Santa Elena is 33. The ratio inside Ft. San Felipe is less (22.0) with the least (7.02) at the northwest bastion where Indian Activities Group artifacts are greatest. It may be that where the behavior involved the most use of Indian vessels that olive jars were not involved, their function having been replaced by Indian jars.

There is another possibility that we may be dealing with here, that would explain the phenomenon we are seeing, and that is differential refuse disposal practices. It may have been that the dumping of refuse in the moat was forbidden or inconvenient (since ramparts, parapets and a palisade isolated those inside the fort from the moat), forcing disposal of refuse within the fort itself. Indeed, we found little evidence of discarding refuse within the moat itself but much refuse inside the fort within the palisade walls.

The best explanation for differential use of olive jars and the extremely high percentage of Indian Activities Group artifacts from the moat and within the fort may lie in the fact that we could be dealing with three occupation periods at the fort site, a pre-fort occupation, a fort occupation between 1572 and 1576, and a post-fort occupation after 1577. Such a situation would account for the contrasts we see in these data since three different behavioral sets would be involved.

Ft. San Felipe Features Compared with Those From Santa Elena

Further insight into the artifact relationships from Ft. San Felipe and the town of Santa Elena can be obtained by examining the features in Santa Elena and Ft. San Felipe. This has been done in Table 3. Here we see that the equal ratio between Kitchen and Indian Activities Group Artifacts within Santa Elena remains the same, as was the case with these data from the soil layers above the features, but they are lower. Those from the features at Ft. San Felipe, however, are different (Table 3). The 1/8" screen features reveal twice as many Kitchen Group artifacts as the Indian Activities Group objects, mostly Indian pottery. The 1/4" screen features, however, have twice as many Indian Activities objects as does the Kitchen Group, the opposite. Why? Part of this can be attributed to the increase

TABLE 3

ARTIFACT GROUP COMPARISON FROM THE FEATURES
IN SANTA ELENA WITH THOSE IN FORT SAN FELIPE

Activities Group	SANTA ELENA 30' BY 100' Area 1981 BU162C Features 1/8 & 1/4" Screen Count	Percent	SANTA ELENA 20' by 30' Area 1982 BU162D Features 1/8" Screen Count	Percent	FT. SAN FELIPE 30 by 120'pArea 1983 BU162G Features 1/8" Screen Count	Percent	FT. SAN FELIPE 30' by 120' Area 1983 BU162G Features 1/4" Screen Count	Percent
KITCHEN (Domestic)	1,138	40.8	412	35.4	343	56.8	200	32.4
ARCHITECTURE	258	9.3	145	12.4	38	6.3	36	5.8
FURNITURE	3	.1	2	.2	-	-	-	-
ARMS	23	.8	32	2.7	1	.2	7	1.1
TOBACCO PIPE	2	.1	6	.5	-	-	-	-
CLOTHING	45	1.6	94	8.1	67	11.1	6	1.0
PERSONAL	8	.3	4	.3	5	.8	3	.5
ACTIVITIES (Spanish)	196	7.0	64	5.5	-	-	-	-
ACTIVITIES (Indian)	1,115	40.0	406	34.9	150	24.8	365	59.2
ARTIFACT TOTAL	2,788	100.00	1,165	100.00	604	100.00	617	100.00
KITCHEN		40.8		35.4		56.8		32.4
ACTIVITIES (Indian)		40.0		34.9		24.8		59.2
OLIVE JAR RATIO TO ALL ARTIFACTS		22.7		22.2		16.9		14.3

in Clothing Group objects by virtue of having used a smaller screen, thus recovering pins, aglets and other items of clothing. However, even if we added all the Clothing Group percentage (11.1%) from the 1/8" screen group of features to the Indian Group, we still would not have the dramatic increase in Indian artifacts we see here.

Also, when we look at the olive jar ratio in the features we find that the features from Santa Elena have a ratio of 22.0, whereas those from Ft. San Felipe are much less, being 16.9 and 14.3. It is interesting to note that the ratio is the same from features at Santa Elena as it is from the levels within Ft. San Felipe, i.e., 22.0. What does this mean? The levels represent an accumulation of artifacts over a broad period of time whereas those from features reflect a shorter time span, in some cases one moment in time and so the opportunity for accumulation of artifacts lying around on the ground is less, particularly where features were backfilled quickly. The layers, however, accumulate artifacts constantly through time.

We noted previously that as the frequency of Indian artifacts increased, as at the northwest bastion, the olive jar ratio decreased. The high ratio (59.2%) of Indian Activities Group artifacts from the 1/4" screen features (Table 3) reveals this phenomenon also. To discover the features responsible for this, we can examine the features in the 1/4" category (Appendix X). This reveals that most of these features are from postholes and the ditch of the casa fuerte. Since the ditch contents would be among the first to be deposited when the casa fuerte was begun in 1572, we might look at these artifacts to get an idea of what was lying on the surface of the ground when the fort was first built. These proveniences are the 10-foot units excavated from the casa fuerte ditch, being numbers 222 through 229. The artifacts arranged according to the Carolina Pattern model is seen in Table 4. From these we can get an idea of the pre-fort occupation.

From Table 4 we can see that there is a 15.4% figure for Kitchen Group artifacts and an 82% figure for the Indian Activities Group. This ratio of Kitchen to Indian Activities artifacts is familiar from the contents of the northwest bastion moat of Ft. San Felipe (Table 2), where almost identical figures are seen, 15.2% for Kitchen and 80.46% for Indian Activities Group artifacts. With these data from the casa fuerte ditch we can test the hypothesis that as Indian artifacts increase, olive jar presence decreases in relation to all other artifacts.

From the casa fuerte ditch there are 345 artifacts, with only 15 olive jar fragments (Appendix X), for a ratio of 4.35, the lowest such ratio yet observed. The nearest parallel is seen in the northwest bastion, where a 7.0 ratio was present. Apparently we are dealing with a similar phenomenon at the northwest bastion and the casa fuerte ditch!, and this phenomenon is dramatically different from the remaining artifact record inside Ft. San Felipe. This discovery from quantitative analysis sheds light on the interpretation of the artifact relationships at the northwest bastion, as well as in Ft. San Felipe itself.

When the casa fuerte ditch was excavated and backfilled quickly, if no prior occupation had taken place on the site, there would be no artifacts

TABLE 4

COMPARISON OF ARTIFACT GROUPS FROM THE CASA FUERTE DITCH IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (BU162G-222-229)

ARTIFACT GROUP	COUNT	PERCENT
KITCHEN	53	15.4
ARCHITECTURE	6	1.7
FURNITURE	-	-
ARMS	1	.3
TOBACCO PIPE	-	-
CLOTHING	-	-
PERSONAL	2	.6
ACTIVITIES (Spanish)	-	-
ACTIVITIES (Indian)	283	82.0
ARTIFACT TOTAL	345	100.0
KITCHEN ACTIVITIES (Indian)		15.4 82.0
OLIVE JAR RATIO TO ALL ARTIFACTS		4.35

found in the ditch fill. If, however, prior occupation had occurred on the site, artifacts from that occupation would likely be found in the ditch fill. The casa fuerte ditch, therefore, represents a collection of artifacts from a pre-fort occupation. We know from the moat Feature 203 (Figs. 24-25) that prior occupation did indeed take place on the site of Ft. San Felipe before that fort was built. The artifacts from the casa fuerte ditch monitor that occupation and reveal that only 18% of the objects are Spanish in origin. The conclusion is, therefore, that the occupation on the site which took place between 1566 and 1572, produced primarily Indian pottery with little Spanish material culture represented.

Two situations would account for this high Indian-to-Spanish ratio. One being that an Indian occupation took place on the site prior to the Spaniards' arrival. This would have produced Indian pottery, then, with the arrival of Spaniards, some Spanish goods would join the Indian pottery on the site. This interpretation is negated by the absence of features on the site that are totally Indian in origin. Such an Indian occupation would have produced many features with no Spanish goods. The occupation represented, therefore, is during the Spanish period prior to 1572, when at least one feature, a moat-like ditch (Fea. 203) was dug, then used as a refuse disposal area for oystershells and other midden (Figs. 24-25).

We are faced, therefore, with a Spanish occupation in which a heavy dependence on Indian vessels, as opposed to those of Spanish manufacture, was in effect. If cooking was the primary activity represented in this occupation on this site and Indian vessels were the major containers in which food was prepared and cooked, then a high Indian-to-Spanish pottery ratio might be expected, such as we see here. The low ratio of olive jar fragments would tend to support this interpretation in that Indian vessels might well be used for storage and cooking when access to olive jars was limited. It should be mentioned here that the majority of Indian ware recovered at Santa Elena is in the form of jars whereas the Spanish ware is primarily smaller escudilla serving bowls, suggesting that Indian pots (which are often heavily charcoal blackened on the exterior and sometimes contain burned food remains on the inside) were the primary food preparation vessels with Spanish wares serving as tablewares. A study of Indian vessel forms and wares is underway at the present time, being undertaken by John Goldsborough.

Another explanation for the high Indian-to-Spanish artifact ratio from the pre-fort occupation would be that the site was used by someone who had very limited access to Spanish material goods, and was forced to depend on more easily available Indian goods for subsistence activities. Such an individual would be a servant or slave or foot soldier whose subsistence might well depend on Indian goods (as indeed the entire settlement of Santa Elena did upon occasion).

What we may also have is simply the relationship between Indian goods and Spanish goods during the first Santa Elena period, from 1566 to 1576, and that when we add 10 years more of occupation (which we do when we use the entire artifact count from the soil levels above the features) we arrive at a more even balance between the Kitchen Group and Indian Activities Group artifacts, resulting from the greater availablility of Spanish goods during the second period of Santa Elena, from 1577 to 1587. This

second Santa Elena period was characterized by a far more antagonistic attitude toward Indians than was the case prior to 1576, as outlined in an earlier section on documentary research. The period from 1577 to 1581, in fact, was a period of warfare, not a period of interaction and trade with friendly natives. More Spanish goods in relation to Indian goods would be expected from this period. Assuming that there was overlap of occupation between the two periods of Santa Elena's existence, the Spanish/Indian goods would tend to equal out when all artifacts from a site are used. Features, however, would reflect more of a one-moment-in-time phenomenon and perhaps a more correct relationship between the Indian and Spanish goods utilized in the system. If this is the case we might find feature data, such as those from the casa fuerte ditch, to be a better monitor of Spanish/Indian material goods relationship than those data from the levels above the features.

Now that we see that the casa fuerte ditch sample of 82% Indian to 18% Spanish artifacts reflects a pre-fort occupation in Santa Elena, it follows that the artifacts from the backfilling of the northwest bastion of Ft. San Felipe must have come from the same occupation. This is an important interpretive discovery that would explain the lack of conformity of the northwest bastion data to that found inside Ft. San Felipe and in Santa Elena. To test this idea we must look at the possibilities for the origin of the soil backfilled into the moat by the Spaniards (South 1983: 59).

From the SYMAP analysis in an earlier part of this section we have seen that the dispersion of refuse during the use of the fort was largely confined to the area inside the palisade wall behind the rampart and parapet of the soil thrown from the moat dug in 1574. It would have been difficult to easily dispose of refuse from the fort into the moat except at those points such as at the drawbridge. When the Spaniards dug the moat, however, refuse from previous occupation would have been lying around on the ground. This would have been thrown into the parapet as the moat was dug. Later, when the moat was backfilled with the parapet, these pre-fort artifacts would have found a resting place within the moat fill. Some artifacts from the fort period, however, would also have been thrown into the moat wherever middens from the fort occupation lay adjacent to the earthworks of the fort. In those areas of the moat where such middens were not present, however, the contents of the moat would be much the same as the contents of the casa fuerte ditch, representing the pre-fort occupation on the site. This explains the difference seen between the northwest bastion and casa fuerte ditch artifact ratios and those from the combined pre-fort and fort occupations.

If our interpretation of these data is correct we can then predict that those features that were backfilled at the time the casa fuerte was built would have a high Indian-to-Spanish artifact ratio, whereas those containing midden from the fort occupation and post-fort occupation would have a high Spanish-to-Indian ratio. We can test this hypothesis by comparing these data from the casa fuerte postholes with those artifacts from the three wells and midden feature 147. We predict that the casa fuerte postholes, like the casa fuerte ditch, should have a high Indian-to-Spanish ratio between artifacts of the Activities (Indian) Group and the Kitchen Group of artifacts. Although the casa fuerte postholes were found to have been re-used during the second period of Santa Elena, the artifacts in the

holes may well date from refuse accumulated during the pre-fort and fort occupation periods. We also expect the midden in the wells and in midden Feature 147 to be reflective primarily of the fort and post-fort occupations. Since the post-fort occupation was characterized by poor relations with the Indians we would expect a high Spanish artifact to Indian artifact ratio to be revealed in features from this period.

From Appendices IX and X we have drawn data for comparing the casa fuerte posthole artifacts with those from the three wells plus Feature 147, which was a Spanish midden-filled pit located at the southwest corner of the casa fuerte (Fig. 6). These data are shown in Table 5.

From Table 5 we can see that the casa fuerte postholes do indeed contain a higher percentage of Indian than Spanish Kitchen Group artifacts, with the combined total being 26.2 Kitchen and 55.3 Indian artifacts. This is in accordance with our idea that these features may well be artifact traps for the pre-fort and fort occupation as was the case with the casa fuerte ditch and the northwest bastion moat.

Table 5 also reveals that the contents of the three wells and midden Feature 147 are heavily oriented toward Spanish artifacts rather than those of Indian origin, with the combined total being three times the number of Spanish artifacts (62.1) to Indian (20.2). This is indeed what one would expect from an occupation postdating the fort period, i.e., from ca. 1577 to 1587 and the archeology has clearly revealed that the casa fuerte was rebuilt after it was burned in 1576.

These findings can be further tested when other excavation is carried out in Ft. San Felipe. By using posthole and trench data from the casa fuerte we have had control of time in that these features were among the earliest on the site when the fort was constructed in 1572. With the artifact relationships seen in such features being predominantly Indian, and those features dating later being predominantly Spanish in origin, we have a means of distinguishing between occupation periods represented by features of unknown time. Hopefully, the hypotheses relating to the three occupations at Ft. San Felipe can be explored in future work on the site.

The Majolica Formula Dating Method

The Mean Majolica Formula dating method of dating Spanish sites was applied to the majolica from the three-foot sample squares to determine the degree to which the date from the three-foot squares predicted the date obtained from the entire excavation by 10-foot squares. The result is seen in Table 6 (South 1977: 238; Lister and Lister 1974, 1976).

As can be seen from Table 6, the Mean Majolica Date of 1573.1 closely approximates the median military occupation of the Ft. San Felipe site of 1574, and is also close to the median historic date for the site of 1576.5. Using this same method of calculation of the Mean Majolica Date, using data from Appendices IV, V, and VI, a Mean Majolica Date for the 10-foot squares was found to be 1573.1, the same date as from the 3-foot squares. The Mean Majolica Date for the total from the features was found to be 1573.7.

TABLE 5

COMPARISON OF ARTIFACTS FROM CASA FUERTE
POSTHOLES WITH THOSE FROM WELL AND MIDDEN FEATURES

CASA FUERTE POSTHOLE* FEATURE NUMBERS	148		237	239	173		198		COMBINED TOTAL	
	COUNT	%	COUNT	COUNT	COUNT	%	COUNT	%	COUNT	%
KITCHEN GROUP ARTIFACTS	11	22.4	0	1	20	44.4	5	14.7	37	26.2
ACTIVITIES (Indian)	28	57.1	7	0	23	51.1	20	58.8	78	55.3
TOTAL ARTIFACTS FROM ALL GROUPS	49		12	1	45		34		141	

WELL AND MIDDEN FEATURE NUMBERS*	WELL 172, 172A, 172B		WELL 217		WELL 146A, 146B, 241B		MIDDEN 147		COMBINED TOTAL	
	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%
KITCHEN GROUP ARTIFACTS	145	62.5	106	70.2	151	56.3	44	65.7	446	62.1
ACTIVITIES (Indian)	45	19.4	26	17.2	57	21.3	17	25.4	145	20.2
TOTAL ARTIFACTS FROM ALL GROUPS	232		151		268		67		718	

* Data from Appendices IX and X

TABLE 6*

THE MAJOLICA FORMULA DATE FOR
THE SAMPLE SQUARES IN FORT SAN FELIPE

Type	Count	Median Mfg. Date**	Product
Columbia Plain	146	1572	229,512
Gunmetal Columbia Plain	47	1572	73,884
Yayal Blue on White	3	1575	4,725
Santo Domingo Blue on White	12	1590	19,080
Ichtucknee (Ligurian)	2	1600	3,200
Isabela Polychrome	-	-	-
Caparra Blue	1	1530	1,530
	211		331,931

Mean Majolica Date = 331,931 ÷ 211 = 1573.1

Median Historic Date for the fort = 1574 (1572-1576)

Median Historic Date for the site = 1576.5 (1566-1587)

*Data from Appendix III.
**Goggin dates are used (South 1977: 239)

Quantitative Analysis of Intersite Data

Ceramic Analysis

Comparison of Spanish Wares from Santa Elena, Ft. San Felipe, and St. Augustine

It was thought prior to excavation at Ft. San Felipe that less majolica and more earthenware would be recovered from inside Ft. San Felipe due to the lower status of soldiers in relation to civilians at Santa Elena. However, in the excavation of the northwest bastion of the fort in 1982, it was found that the moat contained more majolica than had been found in Santa Elena in 1981 and only slightly more earthenware (Goggin 1968). The 1983 ceramic relationships inside Ft. San Felipe revealed a fairly close match to previously excavated data. These figures are shown in Table 7. Compared with St. Augustine, however, the ratio of majolica is three times greater in Ft. San Felipe. Earthenware was only slightly greater inside the fort. We can obtain some idea of the relationship between earthenware,

TABLE 7

COMPARISON OF SPANISH WARES AT SANTA ELENA, FORT SAN FELIPE AND ST. AUGUSTINE

WARES	1981 * B LEVEL SANTA ELENA 38BU162C		1981 * FEATURES FROM SANTA ELENA 38BU162C		1982 ** B LEVEL SANTA ELENA 38BU162D		1982 ** FEATURE FROM SANTA ELENA 38BU162D		MOAT AT Ft. SAN FELIPE LAYERS C,D,E 38BU162E		FT. SAN FELIPE 3' SQ. + 10' SQ. + FEATURES 38BU162G		ST. AUGUSTINE ** ASSEMBLAGE	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
MAJOLICA	949	21.3	333	29.8	431	31.4	121	30.1	372	37.4	2,958	31.4	176	10.2
OLIVE JAR	3,183	71.4	633	56.6	898	65.4	258	64.2	472	47.4	4,329	45.9	1,269	73.4
EARTHENWARE	281	6.3	131	11.7	37	2.7	14	3.5	149	15.0	2,127	22.5	280	16.2
CHINESE PORCELAIN	46	1.0	21	1.9	7	.5	9	2.2	2	.2	20	.2	5	.2
	4,459	100.0	1,118	100.0	1,373	100.0	402	100.0	995	100.0	9,434	100.0	1,730	100.0

* South 1982: 106

** South 1983: 34, 67

*** Deagan 1978: 28-29

a low cost ware, and Chinese porcelain, an expensive ware reflective of status, by dividing earthenware by porcelain from the various contexts, and in so doing gain insight into status relationships represented. The following list makes this comparison of porcelain to earthenware ratios:

Context	Porcelain to Earthenware Ratio	
Santa Elena B Zone 1981	1:6	
Santa Elena Features 1981	1:6	Domestic Santa Elena Household
Santa Elena B Zone 1982	1:5	(Higher Status)
Santa Elena Features 1982	1:1.5	
Ft. San Felipe Moat 1982	1:74	Pre-fort Occupation and Military
Ft. San Felipe Fort 1983	1:106	Ft. San Felipe Occupations
St. Augustine Occupation	1:56	(Lower Status)

(South 1979, 1980, 1982, 1983)
(Deagan 1978)

From this comparison we can see that Ft. San Felipe and St. Augustine have a far higher ratio of earthenware to porcelain than is seen in the town ruins of Santa Elena. This reveals that the status ceramic (porcelain) was seldom found in possession of those occupying Ft. San Felipe and "that porcelain is a powerful indicator of status differences in households at Santa Elena when comparing domestic versus military areas of the site" (South 1983: 70). We know this because porcelain was far more expensive than earthenware, porcelain sometimes being bought with its weight in silver in the sixteenth century (Kamer 1956; Cervantes 1977). The St. Augustine porcelain to earthenware ratio is far closer to that at Ft. San Felipe than the domestic contexts from Santa Elena. The features from Santa Elena in 1982 certainly appear to come from a high status household as reflected in the low earthenware to porcelain ratio.

Comparison of Spanish and Indian Wares at Santa Elena, Ft. San Felipe and St. Augustine

One of the questions of interest in comparing Ft. San Felipe and Santa Elena artifacts with St. Augustine is the relationship of Spanish wares to Indian pottery. As we have seen in a previous section, the casa fuerte features in Ft. San Felipe contain a high Indian to lower Spanish artifact ratio. Features are always more sensitive monitors of specific behavioral activities, function, ethnicity, status, etc. than is the generalized assemblage from a site which reflects a multitude of processes through a greater period of time.

With this broad generalizing pattern in mind rather than the specific analytic picture emerging from features, we can compare the Spanish to Indian wares from Santa Elena, Ft. San Felipe, and St. Augustine. This has been done in Table 8. We see here that from the 1981 levels at Santa Elena the percentage of Indian pottery present is 48%, with 50% coming from the features. The 1982 levels and features reveal 44% and 50% Indian ware, while the combined Ft. San Felipe percentage of Indian ware is 50% also, compared with 52% from St. Augustine. The closeness of these figures is remarkable, reflecting a great redundancy at the various sites at this broad level of comparison. This results from the relationship the Spaniards had with the local Indians, revealing that in terms of Spanish and Indian ceramics procurement, use, breakage and discard, the pattern was much the same at all three sites from a generalized point of view as seen in the archeological record.

Comparison of Indian Wares at Santa Elena, Ft. San Felipe, and St. Augustine

One of the interesting pottery types recovered at Santa Elena is St. Johns pottery, made by Timucua Indians along the St. Johns River near St. Augustine (Goggin 1947, 1949, 1952; Deagan 1978: 30). In plain and check stamped types, it is an easily identifiable ware with a black center and white surface and a chalky paste. The sampling survey of 1979 produced no St. Johns pottery at Ft. San Felipe. It was found in the area of Santa Elena, however (South 1979, 1980). The cross-section cut through the west moat of Ft. San Felipe revealed no St. Johns pottery (South 1980: 69). The A and B zones above the northwest bastion of Ft. San Felipe also revealed no St. Johns pottery (South 1983: 68-70). These contrasts between the town of Santa Elena and Ft. San Felipe in regard to St. Johns Pottery prompted interest in the degree to which this ware would be seen to be present inside Ft. San Felipe.

It would be expected that the St. Augustine assemblage would have a considerable quantity of St. Johns pottery compared to Santa Elena or to Ft. San Felipe and this is indeed the case as seen in Table 9, where St. Johns pottery from various proveniences is tabulated. The locally made Chicora Indian pottery (South 1973), composed primarily of Irene with some early Altamaha attributes (Caldwell and McCann 1941; DePratter, personal communication), is the predominant type at Santa Elena and Ft. San Felipe (Table 9), being present in almost equal amounts from Santa Elena and Ft. San Felipe in relation to Spanish-introduced wares.

We can gain some insight into the relative relationship of Chicora pottery fragments to St. Johns fragments by dividing the count for St. Johns pottery into that for Chicora ware. We expect from the percentage relationship of St. Johns pottery at Ft. San Felipe seen in Table 9, that the ratio of Chicora ware to St. Johns ware would be extremely high inside the fort. The ratios are seen as follows:

Context	St. Johns to Chicora Ratio	
Santa Elena B Zone 1981	1:25	
Santa Elena Features 1981	1:16	Domestic Santa Elena Household
Santa Elena B Zone 1982	1:6	Occupation
Santa Elena Features 1982	1:6	
Ft. San Felipe Moat 1982	1:442	Pre-fort Military
Ft. San Felipe Fort 1983	1:138	Fort and Post-fort Occupation

(South 1979, 1980, 1982, 1983)

What this means is that St. Johns pottery was not absent from use in Ft. San Felipe, but it was dramatically less present there than it was in the households in Santa Elena. One explanation for this might be that there was greater interaction between residents of Santa Elena and Timucua Indians than was the case with the military personnel at Ft. San Felipe. This may have been in the form of Florida Indians being used as servants, slaves, or mates in Santa Elena households. Or, St. Johns vessels may have been used to transport goods into Santa Elena households whereas the military did not resort to this type vessel for transport of goods to the settlement.

We have noted previously that Ft. San Felipe was occupied before the fort of San Felipe was built, and from 1572 until 1576 during the use of the fort, and for some time after the fort was burned, when the casa fuerte was rebuilt. If the casa fuerte ditch and posthole features represent the first Ft. San Felipe excavations on the site and contain artifacts primarily of the first pre-fort period, and St. Johns pottery was not introduced into Santa Elena until later, when interaction with St. Augustine became more frequent, then these features should contain no St. Johns pottery. From Appendices V and VI we find that the casa fuerte ditch and the casa fuerte postholes contain no St. Johns pottery, whereas there is a total of 70 Chicora sherds from the postholes and 283 from the casa fuerte ditch. This tends to suggest that chronology may well be a variable for less St. Johns ware at Ft. San Felipe as was suggested in 1980 (South 1980: 64).

If St. Johns pottery was introduced during the military use of Ft. San Felipe, some of the midden features from that occupation might well reveal St. Johns pottery. The contents of three wells (Feas. 172, 217, 146) and a midden-filled pit (Fea. 147) were examined (Appendix V and VI) for St. Johns pottery. None was present in these features, although 142 sherds of Chicora Indian pottery were present. This suggests that these features were filled before St. Johns pottery was introduced to the site, again, suggesting a chronological interpretation for the explanation of the scarcity of St. Johns pottery in Ft. San Felipe. In fact, when we look at the total artifact counts for all the ceramics from features within Ft. San

TABLE 8

COMPARISON OF SPANISH AND INDIAN WARES
AT SANTA ELENA, FORT SAN FELIPE AND ST. AUGUSTINE

POTTERY	1981 B LEVEL* SANTA ELENA 38BU162C		1981 FEATURES AT* SANTA ELENA 38BU162C		1982 B LEVEL* SANTA ELENA 38BU162D		1982 FEATURES AT* SANTA ELENA 38BU162D		1983 FT. SAN FELIPE 3" Sq. + 10' Sq. + FEATURES 38BU162G		ST. AUGUSTINE** ASSEMBLAGE	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
MAJOLICA	949	11.2	333	14.9	431	17.0	121	15.0	2,958	15.7	176	4.9
OLIVE JAR	3,183	37.3	633	28.4	898	35.5	258	31.9	4,329	23.0	1,269	35.3
EARTHENWARE	281	3.3	131	5.9	37	1.5	14	1.7	2,127	11.2	280	7.7
CHINESE PORCELAIN	46	.5	21	.9	44	1.7	9	1.1	20	.1	5	.1
INDIAN POTTERY***	4,068	47.7	1,115	49.9	1,120	44.3	406	50.3	9,427	50.0	1,870	52.0
	8,527	100.0	2,233	100.0	2,530	100.0	808	100.0	18,861	100.0	3,600	100.0

* South 1982: 108; 1983: 35-36

** Deagan 1978: 28-29

*** 109 + 193 unidentified
(South 1981: 22)

TABLE 9

COMPARISON OF INDIAN WARES AT SANTA ELENA, FORT SAN FELIPE AND ST. AUGUSTINE

	1981 B LEVEL* SANTA ELENA 38BU162C		1981 FEATURES FROM* SANTA ELENA 38BU162C		1982 B LEVEL* SANTA ELENA 38BU162D		1982 FEATURES FROM* SANTA ELENA 38BU162D		1982 N.W. BASTION MOAT AT Ft. SAN FELIPE LAYERS C,D,E 38BU162E		1983 FT. SAN FELIPE 3' SQ. + 10' SQ. + FEATURES 38BU162G		ST. AUGUSTINE ASSEMBLAGE**	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
TOTAL SPANISH-INTRODUCED	4,459	52.3	1,118	50.1	1,373	55.1	402	49.8	995	15.8	9,434	50.0	1,730	48.1
ST. JOHNS PLAIN	125	1.4	55	2.5	120	4.8	23	2.8	2	.1	28	.2	525	14.6
ST. JOHNS CHECK STAMPED	32	.4	11	.5	40	1.6	34	4.2	10	.1	40	.2	700	19.4
TOTAL CHICORA INDIAN POTTERY	3,911	45.9	1,049	46.9	960	38.5	349	43.2	5,302	84.0	8,359	49.6	645	17.9***
	8,527	100.0	2,233	100.0	2,493	100.0	808	100.0	6,309	100.0	18,861	100.0	3,600	100.0

* South 1980: 28; 1982: 109; 1983: 35-36, 67

** Deagan 1978: 28-29

*** "Other"

Felipe we find that no St. Johns pottery was found in any feature!, whereas 515 sherds of locally made Chicora ware was recovered (Appendices V and VI).

If no St. Johns pottery is present in any of the excavated features inside Ft. San Felipe, where did the 68 sherds of St. Johns pottery found inside the fort come from? Four came from the sample squares and the remaining 64 sherds came from the levels of the 10-foot squares (Appendices III and IV). This is where pottery introduced during the second Santa Elena might well be expected to be found. If the post-fort occupation of the site did not produce any features into the subsoils, then refuse such as St. Johns pottery, which may have been introduced to the site after 1577, would be scattered on the ground and recovered through excavation of the 30 by 120 foot area inside the fort. We may find, therefore, that future excavations may be able to use St. Johns pottery along with the presence of oystershell mortar, as indicators of the second Santa Elena. This is certainly an hypothesis to be kept in mind as future analyses are carried out on data from Santa Elena and her forts.

It should be kept in mind, however, that 12 sherds of St. Johns pottery were recovered from the fill layers of the northwest bastion moat, which was likely filled in 1577. Compared with the 5,302 sherds of locally made Chicora ware, however, these 12 sherds certainly suggest it was not present for long or in any large amount prior to 1577 (Fig. 9), probably not coming into Santa Elena in any numbers until after that time.

We might well ask why the increase of St. Johns pottery after the fort was burned in 1576 as opposed to that period prior to that time. It was certainly present in the Timucua culture near St. Augustine during the first Santa Elena period, from 1566 to 1576. We have seen that the contact with local Indians after 1576 was primarily an aggressive one. We have also seen that the pre-fort occupation on the site was characterized by a high percentage of local Chicora Indian pottery and no St. Johns pottery. It might well be that the need being met at Santa Elena for cooking vessels and bowls by the local Indians was not met after 1577 and the Spaniards found it necessary to import St. Johns ware to help fill this need. This is the best explanation at this time for the difference we see between St. Johns pottery at Ft. San Felipe and in the town of Santa Elena.

Plant and Animal Remains from Fort San Felipe

From 3 to 5 liter samples of soil were collected from the features at Ft. San Felipe and these were floated using a 55-gallon drum device with a .2 mm geological screen. All other soil from the features was sifted using either a 1/4" mesh or 1/8" mesh hardware cloth. These samples were analyzed by Elizabeth Reitz and Margaret Scarry and the results are seen in their reports in Appendices XI and XII.

From the faunal analysis by Elizabeth Reitz it was found that the Spaniards inside Ft. San Felipe were eating gopher tortoises. From excavations at St. Augustine, this animal is frequently seen as part of the diet

of the Spaniards. The following discussion by Elizabeth Reitz is taken from her complete report found in Appendix XI.

Since 1979, vertebrate faunal remains from a variety of contexts have been examined from Santa Elena. The excavations in 1983 inside Fort San Felipe provide data on the subsistence activities of men on duty at the fort. This information provides an interesting contrast to data obtained from excavations in the town of Santa Elena itself. People in the town of Santa Elena seem to subsist largely on local wild animals, primarily fish. Domestic animals utilized were primarily chickens, with pigs rare and cows even less common. Fish and pork were main protein sources in the diet.

Several interesting aspects of the soldiers diet appears in the faunal record from Fort San Felipe. Several gopher tortoises were consumed. Since these animals are not native to the Santa Elena area, they may have been brought up from St. Augustine, where gopher tortoises were both a part of the native fauna and of the Spanish diet. The soldiers also appear to have consumed more wild birds than did other members of the town. It is tempting to speculate that this was because of the soliders' access to guns. The soldiers also consumed more domestic meat than was the case at other locations in Santa Elena. This may be a reflection of rations being consumed in the fort. This possibility raises the question of the soldiers relationship with the town. It is possible that soldiers ate a different diet when in the fort than when in the village. It is possible that soldiers did live in the fort rather than in the village, or at least took their main meal in the fort rather than in the village where they might sleep and consume other foods.

The similarity between the fort and quadrangle faunal collections is quite interesting. Prior to this year's work, it seemed probable that the quadrangle was occupied by higher status individuals than the other areas of Santa Elena. It may be that the quadrangle and the fort areas were occupied by people who enjoyed a similar status in the community. Occupants of both areas seem to have had similar access to resources which were different from those enjoyed by other members of the town. These resources included domestic animals and gopher tortoises.

In most respects the Santa Elena data from 1983 excavations confirm a developing style of Spanish subsistence on the coast. This style includes a greater use of wild birds and of large fish individuals than is found in aboriginal sites. Nonetheless the species exploited are those also exploited by aboriginals in the area. It also is characterized by limited use of turtles and domestic livestock. Among the livestock used, over 40% of the individuals are chickens and cattle are very rare. Fish provided most of the biomass, followed by venison and pork.

SUMMARY

A major goal of the 1983 National Science Foundation project at Ft. San Felipe was the testing of sampling methods inside the fort.

The project was designed to explore the relationship between a 1% and 3% stratified systematic unaligned subsurface sample in relation to a totally excavated area 30 by 120 feet inside the Spanish colonial fort of San Felipe (1572-1576) in the city of Santa Elena (1566-1587) on Parris Island, South Carolina, as revealed by SYMAP. Testing the effectiveness of these sample levels was the goal.

A secondary goal of the project was the location of architectural and artifact data of historical and interpretive value in the study of Ft. San Felipe. The discovery of architectural data relating to two casas fuertes or fortified houses inside the fort and of two wells known to have been dug there in 1572, were specific goals. The military function of the fort was expected to be revealed in artifacts recovered.

Both goals were successfully accomplished. The end of one casa fuerte was found in the excavated area and test squares revealed the size to be 50 to 70 feet. The casa fuerte was represented by a two-foot deep ditch with large postholes in the ditch. Artifacts discovered during excavation include crossbow arrow points, cannonballs and arquebus balls, revealing the military function of the site.

The 1% sample of 1979 revealed two clusters of Spanish pottery, one at the northwest corner of the casa fuerte and the other at the southwest corner. The 3% sample of 1983 also revealed two clusters of Spanish pottery in similar locations. The totally excavated area of 1983 also revealed that Spanish pottery density was greatest at the south edge of the casa fuerte and at the northwest corner and along the north edge. It was found, therefore, that the 3% sample was adequate to monitor the dispersion of Spanish pottery within the fort, and that even the 1% sample roughly mirrored these data within the archeological universe. It also mirrored the restraints placed on refuse disposal by the construction of the palisade, parapet and moat in 1574, forcing disposal of refuse inside the palisade wall after that time.

In addition to achieving the goals of the project regarding testing of sampling methods the discovery that the site had three identifiable occupation periods was made: a pre-fort occupation from ca. 1566 to the time the casas fuertes were built in 1572, the fort period from 1572 until it was burned in 1576, and a post-fort period, from 1577, possibly until the site was abandoned by the Spaniards in 1587. The behavioral functions during each period are expected to have been different. The discovery of the pre-fort period was made through the intrusion of the casa fuerte ditch onto a moat-like ditch into which midden was thrown over a period of time. The discovery of the post-fort occupation was made when each one of the casa fuerte postholes was found to have been reused after the fort was

burned by Indians in 1576. This was revealed in the postholes by burned sticks thought to have been from faggots placed around each post to prevent the posts from rotting by isolating them from the sand. The second post in each hole had lime lumps placed around it, also thought to be an attempt to prevent rot by sweetening the soil.

The artifact analysis revealed that porcelain and earthenware are indicators of upper and lower economic status and that there is a dramatic difference between the small amount of porcelain in relation to earthenware found inside Ft. San Felipe compared with that inside the town of Santa Elena. The high Indian (Chicora) ware found in the casa fuerte ditch and postholes compared with Spanish wares was similar to the relationship seen at the northwest bastion of the fort. This is thought to be the result of activity on the site before the fort was built, during the first period of Santa Elena, from 1566 to 1572, providing an explanation for the low percentage of Spanish artifacts in relation to Indian in the moat of the northwest bastion.

The analysis of St. Johns pottery revealed that a dramatic contrast existed between the presence of this ware in the town of Santa Elena where it was more frequently seen, and Ft. San Felipe, where it was scarce. The suggestion was made in 1980, when this phenomenon was first noticed, that the explanation for this likely lay in the fact that the fort represented the first decade of Santa Elena and not the second and that a chronological explanation was involved (South 1980: 64). The explanation of why more St. Johns pottery should have been imported into Santa Elena during the post-fort period is thought to relate to the fact that during this period war with the Indians was almost a constant way of life and this likely reduced the number of local Indian vessels for use in the town and the Spaniards then turned to importing St. Johns ware from the St. Augustine area to meet the need for cooking vessels and serving bowls in the town at a lower price than Spanish wares.

Various methods of historical archeology have been tested in this study, involving documentary research, observation and interpretation and artifact analysis using a number of analytical tools. These included SYMAP, the Carolina Pattern, the Mean Majolica Formula dating method and comparative analysis of artifact class ratios. The success of this testing of methods is demonstrated in the various sections of this report.

RECOMMENDATIONS

With only the west end of the casa fuerte excavated, the east half of the remaining undisturbed area inside Ft. San Felipe is in need of excavation, which would reveal the remaining part of the casa fuerte. Hypotheses suggested by artifact analyses in this project will be used to explore further the casa fuerte and Ft. San Felipe, such as the status information in earthenware and porcelain relationships, the Spanish/Indian relationships in Chicora and St. Johns pottery and the role of chronology in explaining the presence of St. Johns pottery at Ft. San Felipe.

Also of great interest are the three wells discovered but not excavated beyond a depth of two feet in this project. One of these is filled with Spanish refuse and is a valuable repository of subsistence data for the period of fort occupation prior to the abandonment of the well as well as during its use as a refuse dump. The two wells not used as refuse deposits, a replacement well and one of the two known to have been dug in 1572, should also be excavated and subsistence data and artifacts recovered. There is also a good possibility that barrel wells will be found in these wells. Exposing these barrels, photographing and measuring and then backfilling should be carried out. A proposal to carry out these recommendations has been submitted to the National Science Foundation for work in the 1984 summer field season. If this is not funded at that time the proposal will be resubmitted since this site is one of the most important in America for gathering data of use in understanding Spanish colonial settlement from an archeological perspective.

A grant proposal has also been submitted to the National Endowment for the Humanities for the 1985 summer season of fieldwork to carry out a sampling scheme between the fort and the area sampled to the west of the eighth tee of the Marine Corps golf course. This would include sampling in the area of the eighth fairway. This would provide a 1% sample of a large area not yet explored at Santa Elena.

A proposal has also been submitted to the National Endowment for the Humanities for documentary research to accompany the historical archeology carried out on the site during the years since 1979. Eugene Lyon would examine many Spanish documents through microfilm sources and provide a transcription and a translation with annotated notes of these data which may well reveal valuable and much needed historical documentation for the site. However, this proposal was placed in a "deferred" status by NEH and the possibility of funding is thought to be slight. The need to correlate historic site archeology information with documentary information was not deemed to be sufficient justification for funding such research.

Since the SYMAP testing of sampling methods of Ft. San Felipe was found to be remarkably successful in this project it was not recommended that further sampling be carried out on the site. Rather, total excavation of the remaining casa fuerte and the wells was given priority recommendation for further work at Ft. San Felipe. Hopefully such work will be accomplished in the years to come.

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APPENDIX I

THE MANNER OF FORTIFYING WITH EARTH

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There is another maner of fortifying which is with earth: in which, in stead of a face of bricke or stone, is a face of turffe used, and for the Counterforts, faggots: which manner of building is of little charge in respect of the other, and yet is much more durable against a forceable batterie. The experience thereof hath been sufficiently seene in this late warres of ye Low Countries; but it is not so durable against the wether: but being of good earth and the faggots greene, it wil the longer continue: and although the face wast and moulder away with the wether, yet will the Fort continue defenceable. And the best is, the face may be repayred againe with little charge.

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The manner of the worke is this: the turffe must be cut like a wedge, of 12. or 14. inches long, and 5. or 6. inches borade equidistant, the one ende 4. or 5. inches thicke, and the other sharpe, and these turffes would be taken in the best ground that lyeth neere about the fort, and must be cut with a long sharpe Spade, of fiue or five inches broade, and 14. inches long, which must be well steeled, and kept very sharpe: and the turffe must be caryed and handled without breaking, and leyde in the worke, the great ende outward, and the grassy side downeward, and scarping, one in 5. or 6. foote, the rampire behinde the turffe rising with the earth that is throwne out of the ditch, as fast as the face of the workes riseth. (And when the face is raised the heigth of five turffes, and the earth behind it layed even, and spread almost as broade as the rampire is pretended (which may be 20.30. or 40. foote, and more or lesse, as the earth that may be throwne out of the ditch will make it) or at the least so broade as it is thought that the wood will lye: for to say truth, to throwe downe the earth, or to spread it too broade before the wall be raysed, were a point of no great wisedome) stretch a lyne and pare the turffe even with a sharpe Spade, but scarping, according to the first scarpe you layde them at, and then lay a rowe of faggots, which faggots must be 8. or 9. foote long, and more or lesse as the wood will give them, but not thicker then that you may almost gripe them betwixt your two hands, the great ende of the wood lying all one way in the faggot, which end must be stamped against the ground that it may lye even in the wall, and must be bound with three bonds and layde in the worke the great ends outward, one inch over the turffe, and must be thrust up fast and close the one to the other, but not layd thicker then one fagot at once. And upon the small

ends of those first layd faggots, must other faggots be layde, whose small ends must overlappe the small ends of the said first faggots, some three foote and a halfe or thereabouts. And upon the great ends of these second faggots, must a third faggot be layde, whose small ends must likewise overlappe the great ends of the said second faggots, as the small ende of the second did the small ends of the first, (and where wood is plentie, having haste to raise the worke, lay a fourth faggot in like manner), which being done, rayse againe the face of the worke five turffes higher, paring them by lyne as is aforesayde, and raysing the earth behinde them as before, and then lay another rowe of faggots, and thus continue the worke, until it riseth some twelve foote, above the foote it standeth upon; which foote must be left five foote broade, untill the Fort be full ended to receive the earth which shall be throwne out of the bottome of the ditch, which from thence must be throwne into the Fort, and this foote must be afterward cut narrower flat off, but not so narrowe that it might put the rampire that standeth upon it in danger of falling. Which done, raise a parapet of some fiue or five foote broade, more or lesse, according to the greatness of the Fort, and largenesse of the rampier, and make the ditch if it be where water aboundeth the broader, but standing dry, the narrower and deeper. A great care must be had in making of the ditch, of the goodnesse of the ground, for feare of laying the worke under feete, to avoide which inconvenience, the best way is to leave the wall a verie good foote, and not to sinke the ditch too deepe on that side next it, but rather to make a secret ditch in the midst, or to make that side next the counterscarpe very deepe, leaving the other side the showler. Where wood is scarce, there use none but in the bulwarke only, and there as little as you may, but only to stay the face of the bulwarke; and raise the face of the curtine with turffes only, giving them somewhat the more scarpe, or for a neede use no wood at all, and where turffe would fall out scant, so that the ditch would be well watered, use none but in the bulwarks, and rayse the courtine with earth only, making every way a vertue of necessitie.

APPENDIX II

BEADS FROM SANTA ELENA (1983 SEASON)

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December 20, 1983

Three beads were recovered during the 1983 excavations at Santa Elena. These beads, in contrast to the large number of glass beads recovered during the 1982 season, are attributable to the Spanish occupation on the basis of context or direct association with Spanish material. Each of the beads will be described in detail in the following paragraphs.

The first bead (38BU162G-198), manufactured of transparent red garnet by lapidary techniques, is attached to a segment of silver wire bordado by a loop of the wire extended through the perforation. This mode of attachment appears more in the nature of loss prevention than of decoration as a part of the bordado. The bead was created by first perforating a small garnet crystal or fragment and then grinding a series of 17 rather unequal facets around the body of the bead, 8 of which are inclined toward one end and 9 toward the other. Larger facets tend to be separated by smaller facets on each end and to mesh between the larger facets on the opposed end. The bead is 4.0 mm in maximum diameter, 3.2 mm in diameter across the flats, and is 2.8 mm in length. The perforation, 1.2 mm in diameter, originates in a fracture pit at one end and tapers slightly toward the other end. The color and clarity of the stone is good although several small flaws are apparent upon close examination.

The second bead (38BU162G-146), derived from the upper fill of the well, is a tube drawn tumbled spherical glass bead of transparent amethyst color. The bead is 6.3 mm in diameter, 4.9 mm in length, and has a perforation 2.2 mm in diameter. The bead surface is in good condition, with little patina evident, although surface striations parallel to the perforation and a certain amount of erosion is evident at each end. This bead is within the typological class IIa in the Kidd classification (Kidd and Kidd 1970).

The faceted garnet bead first described is representative of a diverse yet related class of beads most closely associated with the early Spanish colonial occupation of the Americas. Such beads are manufactured of a variety of raw materials, such as crystal quartz, jet, amber, and garnet, through the use of lapidary techniques. These beads would appear to be associated with personal adornment or religious objects such as rosaries rather than primarily for trade or barter with aboriginal groups. The association of the faceted garnet bead with bordado, itself an item of personal adornment possessing status connotations, tends to confirm such an assumption.

The glass bead has not been previously reported from Santa Elena. The form and color of this bead are not out of place within a Spanish context (Marvin Smith, personal communication 1983).

The third bead (38BU162G-146A), from the upper level of the Spanish midden-filled well, is made of amber, the surface of which has been effected by ground conditions. I tested the material through heating a small splinter in the vial on a stainless steel spatula and it melted as per expectation for amber. Microscopic examination of a broken surface at 20X also disclosed the characteristic fracture pattern for amber. In form the bead appears to have been roughly spherical although slight facets may have been present at one time. The fragment represents approximately one third of the original bead and does not display any trace of the central perforation. The fragmentary length of the bead is 5 +mm, estimated original length 6 mm; and the fragmentary diameter of the bead is 5.5 +mm, estimated original diameter 7 mm. Amber beads have been recovered from other Spanish colonial contexts (Marvin Smith, personal communication March 24, 1984). Such beads, along with the garnet, jet, rock crystal, agate, ivory, ebony, and olive wood beads may be associated with Spanish dress and accouterments, particularly rosaries.

REFERENCES

Kidd, Kenneth E., and Martha A. Kidd
1970 A Classification System for Glass Beads for the Use of Field Archeologists. Canadian Historic Sites, Occasional Papers in Archaeology and History: 45-89.

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	2A	2B	3A	4A	5A	5B
Majolica						
Columbia Plain	2	-	1	1	11	2
Gunmetal Columbia Plain	-	-	-	-	-	-
Yayal Blue on White	-	-	-	-	-	-
Santo Domingo Blue on White	-	-	-	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	1	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	-	-	-	-
Green Cylinder	-	-	-	-	-	-
Fine White	-	-	-	-	-	-
Indeterminate	-	-	1	1	-	2
TOTAL MAJOLICA	3	-	2	2	11	4
OLIVE JAR	5	2	2	3	13	5
Earthenware						
Green Lead Glazed	-	-	3	1	2	-
Lead Glazed Redware	2	1	-	2	6	6
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	-	-	-	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	-	-	-	-	-	-
TOTAL EARTHENWARE	2	1	3	3	8	6
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	2	1	3	3	8	6
TOTAL SPANISH INTRODUCED WARES	10	3	7	8	32	15
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	3	-	1	-	-	4
Curvilinear Comp. Stamped	-	1	-	-	-	-
Plain	7	3	2	1	9	8
Incised	1	1	1	-	2	1
Punctated/Pinched/Applique	-	-	-	-	-	1
Cob Impressed	-	-	-	-	-	-
Simple Stamped	1	-	-	-	-	-
Check Stamped	-	-	-	1	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	6	1	4	5	4	8
TOTAL 16TH CENTURY INDIAN	18	6	8	7	15	22
TOTAL 16TH CENTURY CERAMICS	28	9	15	15	47	37
CHERT FRAGMENTS OR TOOLS	-	-	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	6A	7B	7B	8A	8B	9A
Majolica						
Columbia Plain	9	2	2	3	-	2
Gunmetal Columbia Plain	1	1	1	-	-	7
Yayal Blue on White	-	-	-	-	-	1
Santo Domingo Blue on White	-	-	1	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	1	-	-	1	-	1
Green Cylinder	-	-	-	8	-	-
Fine White	-	-	-	-	-	-
Indeterminate	1	1	2	-	-	3
TOTAL MAJOLICA	12	4	6	12	-	14
OLIVE JAR	31	4	5	5	6	19
Earthenware						
Green Lead Glazed	-	1	-	1	-	2
Lead Glazed Redware	17	2	2	2	7	3
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	1	-
Mexican Red Painted	1	-	-	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Feldspar Inlaid	2	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	1	-	12	-	1	1
TOTAL EARTHENWARE	21	3	14	3	9	6
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	21	3	14	3	9	6
TOTAL SPANISH INTRODUCED WARES	64	11	25	20	15	39
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	1	-	8	2	-	2
Curvilinear Comp. Stamped	-	-	-	-	-	-
Plain	6	7	1	1	9	2
Incised	1	1	-	1	-	1
Punctated/Pinched/Applique	-	-	-	-	-	-
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	-	-	-	-	-
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	7	-	3	4	-	3
TOTAL 16TH CENTURY INDIAN	15	8	12	8	9	8
TOTAL 16TH CENTURY CERAMICS	79	19	37	28	24	47
CHERT FRAGMENTS OR TOOLS	-	-	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	9B	10A	10B	11A	12A	12B
Majolica						
Columbia Plain	4	15	5	4	1	8
Gunmetal Columbia Plain	1	3	3	-	1	-
Yayal Blue on White	-	-	-	-	-	-
Santo Domingo Blue on White	-	-	7	-	-	1
Caparra Blue	-	-	-	-	1	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	-	-	-	-
Green Cylinder	-	-	-	-	1	1
Fine White	-	-	-	-	-	-
Indeterminate	1	9	7	2	1	1
TOTAL MAJOLICA	6	34	16	6	5	11
OLIVE JAR	14	24	15	2	11	8
Earthenware						
Green Lead Glazed	-	2	1	-	-	-
Lead Glazed Redware	2	10	3	3	3	4
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	-	1	-	-	1	-
Quetzacoatl Ware	-	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	9	6	3	-	-	-
TOTAL EARTHENWARE	11	19	7	3	4	4
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	11	19	7	3	4	4
TOTAL SPANISH INTRODUCED WARES	31	77	38	18	20	23
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	1	-	-	1	-
Rectilinear Comp. Stamped	1	5	1	1	2	6
Curvilinear Comp. Stamped	-	-	-	-	-	-
Plain	4	15	2	5	6	3
Incised	2	3	3	-	6	-
Punctated/Pinched/Applique	-	2	-	1	-	-
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	1	-	-	-	1
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	2	8	-	1	7	6
TOTAL 16TH CENTURY INDIAN	9	35	6	8	11	16
TOTAL 16TH CENTURY CERAMICS	40	112	44	19	42	39
CHERT FRAGMENTS OR TOOLS	-	-	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	13A	13A	14A	15A	16A	17A
Majolica						
Columbia Plain	3	-	-	3	5	8
Gunmetal Columbia Plain	-	-	1	1	5	6
Yayal Blue on White	-	-	-	-	-	-
Santo Domingo Blue on White	-	-	-	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	2	-	-	1	-
Green Cylinder	2	-	-	3	1	-
Fine White	-	-	-	-	-	-
Indeterminate	3	-	-	5	4	1
TOTAL MAJOLICA	8	2	1	12	16	15
OLIVE JAR	37	6	2	2	20	5
Earthenware						
Green Lead Glazed	1	6	1	-	5	-
Lead Glazed Redware	5	-	-	1	-	2
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	1	-	-
Mexican Red Painted	-	-	-	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	-	-	-	-	-	-
TOTAL EARTHENWARE	6	6	1	2	5	2
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	6	6	1	2	5	2
TOTAL SPANISH INTRODUCED WARES	51	14	4	16	41	22
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	7	2	2	3	2	1
Curvilinear Comp. Stamped	-	-	-	-	-	-
Plain	2	2	2	10	4	1
Incised	2	-	-	2	-	-
Punctated/Pinched/Applique	-	-	-	-	-	1
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	-	-	1	-	-
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	3	-	4	3	3	1
TOTAL 16TH CENTURY INDIAN	14	4	8	19	9	4
TOTAL 16TH CENTURY CERAMICS	65	18	12	35	50	26
CHERT FRAGMENTS OR TOOLS	-	-	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	18A	20A	21A	22A	22B	23A
Majolica						
Columbia Plain	19	8	2	1	-	3
Gunmetal Columbia Plain	6	-	-	1	1	-
Yayal Blue on White	-	-	-	-	-	1
Santo Domingo Blue on White	1	1	-	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	2	-	-	-
Green Cylinder	-	-	1	-	-	-
Fine White	-	-	-	-	-	-
Indeterminate	2	-	4	-	-	-
TOTAL MAJOLICA	28	9	9	2	1	4
OLIVE JAR	39	14	9	11	-	10
Earthenware						
Green Lead Glazed	1	-	-	-	-	-
Lead Glazed Redware	2	10	3	-	-	2
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	1
Mexican Red Painted	-	-	-	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	-	3	2	-	-	-
TOTAL EARTHENWARE	3	13	5	-	-	3
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	3	13	5	-	-	3
TOTAL SPANISH INTRODUCED WARES	70	36	23	13	1	17
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	1	-	-	-	-
Rectilinear Comp. Stamped	2	3	2	1	-	6
Curvilinear Comp. Stamped	-	-	-	-	-	-
Plain	18	9	5	4	-	8
Incised	-	10	3	1	1	3
Punctated/Pinched/Applique	1	1	-	-	-	-
Cob Impressed	-	-	-	-	-	-
Simple Stamped	1	-	-	-	-	-
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	3	11	2	18	1	2
TOTAL 16TH CENTURY INDIAN	25	35	12	24	2	19
TOTAL 16TH CENTURY CERAMICS	95	71	35	37	3	36
CHERT FRAGMENTS OR TOOLS	-	-	3	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	23B	24A	25A	26A	27A	28A
Majolica						
Columbia Plain	-	-	2	8	-	3
Gunmetal Columbia Plain	-	-	-	1	-	1
Yayal Blue on White	-	-	-	1	-	-
Santo Domingo Blue on White	-	-	-	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	-	1	-	-
Green Cylinder	-	-	1	-	-	-
Fine White	-	-	-	-	-	-
Indeterminate	-	-	-	8	-	1
TOTAL MAJOLICA	-	-	3	19	-	5
OLIVE JAR	-	2	6	27	3	5
Earthenware						
Green Lead Glazed	-	-	-	-	-	-
Lead Glazed Redware	-	1	4	6	-	1
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	-	-	-	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	-	-	-	1	-	2
TOTAL EARTHENWARE	-	1	4	7	-	3
ORIENTAL PORCELAIN	-	-	-	-	2	-
TOTAL EARTHENWARE PLUS PORCELAIN	-	1	4	7	2	3
TOTAL SPANISH INTRODUCED WARES	-	3	13	53	5	13
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	1	-	-	-	-	-
Rectilinear Comp. Stamped	7	1	-	7	-	1
Curvilinear Comp. Stamped	-	-	-	-	-	-
Plain	6	4	5	7	-	2
Incised	-	-	2	-	-	2
Punctated/Pinched/Applique	3	2	-	-	-	-
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	-	-	-	-	-
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	5	2	2	3	-	3
TOTAL 16TH CENTURY INDIAN	22	9	9	17	-	8
TOTAL 16TH CENTURY CERAMICS	22	12	22	70	5	21
CHERT FRAGMENTS OR TOOLS	-	-	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	29A	29B	30A	30B	31A	33A
Majolica						
Columbia Plain	2	-	3	1	-	2
Gunmetal Columbia Plain	-	-	5	-	-	1
Yayal Blue on White	-	-	-	-	-	-
Santo Domingo Blue on White	-	-	1	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	2	2	-	-
Green Cylinder	-	-	-	-	-	-
Fine White	-	-	-	-	-	-
Indeterminate	-	-	-	-	-	4
TOTAL MAJOLICA	2	-	11	3	-	7
OLIVE JAR	4	1	36	30	2	19
Earthenware						
Green Lead Glazed	2	-	4	2	-	-
Lead Glazed Redware	-	1	-	2	-	1
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	-	-	1	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	-	-	-	1	-	4
TOTAL EARTHENWARE	2	1	5	5	-	5
ORIENTAL PORCELAIN	2	1	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	4	2	5	5	-	5
TOTAL SPANISH INTRODUCED WARES	10	3	52	38	2	31
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	3	7	8	5	1	3
Curvilinear Comp. Stamped	-	-	-	-	-	-
Plain	5	13	8	6	1	4
Incised	2	4	9	11	-	3
Punctated/Pinched/Applique	-	1	-	1	-	2
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	-	-	-	-	-
Check Stamped	-	4	-	-	-	1
Unidentified Stamped	-	-	-	-		-
Unidentifiable	1	25	14	13	1	18
TOTAL 16TH CENTURY INDIAN	11	54	39	36	3	31
TOTAL 16TH CENTURY CERAMICS	21	57	91	74	5	62
CHERT FRAGMENTS OR TOOLS	-	-	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	34A	35A	36A
Majolica			
Columbia Plain	-	1	-
Gunmetal Columbia Plain	-	-	-
Yayal Blue on White	-	-	-
Santo Domingo Blue on White	-	-	-
Caparra Blue	-	-	-
Ichtucknee Blue on Blue	-	-	-
Isabela Polychrome	-	-	-
Santa Elena Blue on White	-	-	-
Green Cylinder	-	-	-
Fine White	-	-	-
Indeterminate	-	3	-
TOTAL MAJOLICA	-	4	-
OLIVE JAR	1	7	-
Earthenware			
Green Lead Glazed	-	-	-
Lead Glazed Redware	-	2	-
Redware	-	-	-
Orange Micaceous	-	-	-
Mexican Red Painted	-	-	-
Quetzacoatl Ware	-	-	-
Fine Orange	-	1	-
Feldspar Inlaid	-	-	-
Tonola	-	-	-
Indeterminate	-	-	-
TOTAL EARTHENWARE	-	3	-
ORIENTAL PORCELAIN	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	-	3	-
TOTAL SPANISH INTRODUCED WARES	1	14	-
Indian Pottery (16th Century)			
St. John's Plain	-	-	-
St. John's Check Stamped	-	-	-
Rectilinear Comp. Stamped	-	3	-
Curvilinear Comp. Stamped	-	-	-
Plain	3	1	4
Incised	2	4	1
Punctated/Pinched/Applique	-	-	-
Cob Impressed	-	-	-
Simple Stamped	-	-	-
Check Stamped	-	-	-
Unidentified Stamped	-	-	-
Unidentifiable	3	13	-
TOTAL 16TH CENTURY INDIAN	8	21	5
TOTAL 16TH CENTURY CERAMICS	9	35	5
CHERT FRAGMENTS OR TOOLS	-	1	-
TRIANGULAR BIFACES	-	-	-

APPENDIX III

CERAMICS FROM 3' SQUARES IN FT. SAN FELIPE (38BU162G)

Type	Count	Ceramic Group Percent	Percent Total Spanish	Percent TOTAL Ceramic
Majolica				
Columbia Plain	146	47.25	14.67	8.72
Gunmetal Columbia Plain	47	15.21	4.72	2.81
Yayal Blue on White	3	0.97	0.30	0.18
Santo Domingo Blue on White	12	3.88	1.21	0.72
Caparra Blue	1	0.32	0.10	0.06
Ichtucknee Blue on Blue	2	0.65	0.20	0.12
Isabela Polychrome	-	0.00	0.00	0.00
Santa Elena Blue on White	13	4.21	1.31	0.78
Green Cylinder	18	5.83	1.81	1.07
Fine White	-	0.00	0.00	0.00
Indeterminate	67	21.68	6.73	4.00
TOTAL MAJOLICA	309	100.00	31.05	18.45
OLIVE JAR	472	100.00	47.44	28.18
Earthenware				
Green Lead Glazed	35	16.75	3.52	2.09
Lead Glazed Redware	118	56.46	11.86	7.04
Redware	-	0.00	0.00	0.00
Orange Micaceous	3	1.44	0.30	0.18
Mexican Red Painted	4	1.91	0.40	0.24
Quetzacoatl Ware	-	0.00	0.00	0.00
Fine Orange	1	0.48	0.10	0.06
Feldspar Inlaid	2	0.96	0.20	0.12
Tonola	-	0.00	0.00	0.00
Indeterminate	46	22.01	4.62	2.75
TOTAL EARTHENWARE	209	100.00	21.01	12.48
ORIENTAL PORCELAIN	5	0.00	0.50	0.30
TOTAL EARTHENWARE PLUS PORCELAIN	214	100.00	21.51	12.78
TOTAL SPANISH INTRODUCED WARES	995	100.00	100.00	59.40
Indian Pottery (16th Century)				
St. John's Plain	-	0.00		0.00
St. John's Check Stamped	4	0.59		0.24
Rectilinear Comp. Stamped	114	16.76		6.81
Curvilinear Comp. Stamped	1	0.15		0.06
Plain	225	33.09		13.43
Incised	86	12.65		5.13
Punctated/Pinched/Applique	16	2.35		0.96
Cob Impressed	-	0.00		0.00
Simple Stamped	5	0.74		0.30
Check Stamped	6	0.88		0.36
Unidentified Stamped	-	0.00		0.00
Unidentifiable	223	32.79		13.31
TOTAL 16TH CENTURY INDIAN	680	100.00		40.60
TOTAL 16TH CENTURY CERAMICS	1,675	100.00		100.00

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	38A	39A	40A	41A	42A	43A
Majolica						
Columbia Plain	20	22	19	5	9	11
Gunmetal Columbia Plain	-	1	2	1	4	2
Yayal Blue on White	-	1	-	-	-	1
Santo Domingo Blue on White	2	2	5	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	1	-	-	-	1	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	1	-	3	1
Green Cylinder	1	-	2	4	6	1
Fine White	-	-	-	-	-	1
Indeterminate	7	6	6	7	8	13
TOTAL MAJOLICA	31	32	35	17	31	30
OLIVE JAR	24	22	36	31	40	58
Earthenware						
Green Lead Glazed	1	1	2	1	2	1
Lead Glazed Redware	11	15	17	6	16	7
Redware	-	-	-	-	-	11
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	-	1	-	-	-	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	1	1	-	2	2	1
TOTAL EARTHENWARE	13	18	19	9	20	20
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	13	18	19	9	20	20
TOTAL SPANISH INTRODUCED WARES	68	72	90	57	91	108
Indian Pottery (16th Century)						
St. John's Plain	1	1	1	-	-	-
St. John's Check Stamped	-	-	-	-	-	4
Rectilinear Comp. Stamped	10	11	8	3	38	39
Curvilinear Comp. Stamped	1	2	8	3	15	2
Plain	58	41	27	21	13	55
Incised	12	11	9	9	15	17
Punctated/Pinched/Applique	8	1	6	4	8	6
Cob Impressed	-	2	-	-	-	-
Simple Stamped	2	2	2	1	-	-
Check Stamped	3	-	2	-	-	-
Unidentified Stamped	-	-	-	5	3	-
Unidentifiable	51	57	65	35	77	61
TOTAL 16TH CENTURY INDIAN	146	128	128	81	169	184
TOTAL 16TH CENTURY CERAMICS	214	200	218	138	260	292
CHERT FRAGS. OR TOOLS	-	-	-	1	3	-
TRIANGULAR BIFACES	-	-	-	-	1	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	44A	44B	45A	45B	46A	46B
Majolica						
Columbia Plain	12	10	7	10	16	2
Gunmetal Columbia Plain	-	-	1	-	5	-
Yayal Blue on White	-	-	2	-	-	-
Santo Domingo Blue on White	-	2	-	-	2	1
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	1	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	1	-	-	1
Green Cylinder	-	-	4	2	3	-
Fine White	-	-	-	-	-	-
Indeterminate	3	6	11	9	27	1
TOTAL MAJOLICA	15	18	27	21	53	5
OLIVE JAR	20	37	65	19	103	18
Earthenware						
Green Lead Glazed	-	-	-	-	9	-
Lead Glazed Redware	16	4	23	11	39	8
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	1	-
Mexican Red Painted	3	-	-	1	2	-
Quetzacoatl Ware	-	-	1	-	-	-
Fine Orange	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	3	2	1	1	14	1
TOTAL EARTHENWARE	22	6	25	13	65	9
ORIENTAL PORCELAIN	-	-	-	-	2	-
TOTAL EARTHENWARE PLUS PORCELAIN	22	6	25	13	67	9
TOTAL SPANISH INTRODUCED WARES	57	61	117	53	223	32
Indian Pottery (16th Century)						
St. John's Plain	-	-	3	1	-	-
St. John's Check Stamped	1	1	3	4	2	-
Rectilinear Comp. Stamped	17	24	7	22	48	11
Curvilinear Comp. Stamped	2	6	16	7	-	16
Plain	17	20	16	36	59	10
Incised	11	10	18	9	39	12
Punctated/Pinched/Applique	2	3	5	7	8	3
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	-	-	-	-	-
Check Stamped	-	-	-	1	3	-
Unidentified Stamped	-	-	20	9	-	6
Unidentifiable	59	58	123	68	191	41
TOTAL 16TH CENTURY INDIAN	109	122	211	164	350	99
TOTAL 16TH CENTURY CERAMICS	166	183	328	217	573	131
CHERT FRAGMENTS OR TOOLS	-	-	1	-	3	1
TRIANGULAR BIFACES	-	-	-	-	-	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	47A	48A	48B	49A	50A	51A
Majolica						
Columbia Plain	18	3	7	4	14	60
Gunmetal Columbia Plain	-	2	-	-	-	3
Yayal Blue on White	1	1	1	1	3	3
Santo Domingo Blue on White	1	-	-		-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	1	-	-	2	2
Isabela Polychrome	-	-	-	-	-	1
Santa Elena Blue on White	2	1	1	1	1	5
Green Cylinder	3	1	-	1	2	7
Fine White	-	-	-	-	-	3
Indeterminate	30	6	11	4	8	30
TOTAL MAJOLICA	55	15	20	11	30	114
OLIVE JAR	143	20	51	37	30	90
Earthenware						
Green Lead Glazed	7	-	-	-	3	10
Lead Glazed Redware	42	10	9	3	24	61
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	7	-	2	-	-	1
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	1	1	3	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	7	2	-	-	-	-
TOTAL EARTHENWARE	64	13	14	3	27	72
ORIENTAL PORCELAIN	2	1	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	66	14	14	3	27	72
TOTAL SPANISH INTRODUCED WARES	264	49	85	51	87	276
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	1	3
St. John's Check Stamped	3	-	-	-	-	-
Rectilinear Comp. Stamped	22	7	10	2	17	52
Curvilinear Comp. Stamped	28	-	1	17	-	-
Plain	52	16	37	31	45	79
Incised	27	1	6	7	19	39
Punctated/Pinched/Applique	8	2	2	6	8	14
Cob Impressed	3	-	2	-	-	-
Simple Stamped	8	-	-	-	-	-
Check Stamped	-	-	1	-	-	1
Unidentified Stamped	37	7	23	28	-	-
Unidentifiable	183	7	57	101	55	111
TOTAL 16TH CENTURY INDIAN	371	40	139	192	145	299
TOTAL 16TH CENTURY CERAMICS	635	89	224	243	232	575
CHERT FRAGMENTS OR TOOLS	-	-	-	1	-	-
TRIANGULAR BIFACES	1	-	-	-	-	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	52A	52B	53A	53B	54A	54B
Majolica						
Columbia Plain	67	6	12	30	19	6
Gunmetal Columbia Plain	22	-	7	5	19	6
Yayal Blue on White	7	-	3	5	2	1
Santo Domingo Blue on White	-	1	1	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	3	1	1	1	-	-
Isabela Polychrome	-	-	-	2	-	-
Santa Elena Blue on White	4	1	5	9	3	1
Green Cylinder	9	1	4	19	3	2
Fine White	-	-	-	-	-	-
Indeterminate	23	2	15	35	15	11
TOTAL MAJOLICA	135	12	48	106	61	27
OLIVE JAR	123	8	88	114	65	32
Earthenware						
Green Lead Glazed	6	-	1	4	7	-
Lead Glazed Redware	53	3	44	55	23	9
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	2	-	1	2	1	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	4	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	1	1	-	5	1	-
TOTAL EARTHENWARE	66	4	46	66	32	9
ORIENTAL PORCELAIN	-	-	-	-	-	1
TOTAL EARTHENWARE PLUS PORCELAIN	66	4	46	66	32	10
TOTAL SPANISH INTRODUCED WARES	324	24	182	286	158	69
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	1	-	-	-	-	1
Rectilinear Comp. Stamped	27	3	21	21	23	11
Curvilinear Comp. Stamped	-	-	1	6	3	5
Plain	82	4	29	40	34	24
Incised	41	1	19	16	22	18
Punctated/Pinched/Applique	10	-	2	5	6	1
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	-	-	-	-	2
Check Stamped	1	-	2	1	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	58	5	36	55	43	41
TOTAL 16TH CENTURY INDIAN	220	13	110	144	131	103
TOTAL 16TH CENTURY CERAMICS	544	37	292	430	289	172
CHERT FRAGMENTS OR TOOLS	-	-	-	1	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	55A	56A	57A	57B	58A	58B
Majolica						
Columbia Plain	11	31	51	8	51	16
Gunmetal Columbia Plain	5	-	2	1	2	2
Yayal Blue on White	-	2	1	-	4	4
Santo Domingo Blue on White	-	2	4	2	3	1
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	1	1	2	1	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	3	2	7	-	3	5
Green Cylinder	-	1	13	5	6	3
Fine White	2	3	2	-	2	2
Indeterminate	28	38	88	8	23	21
TOTAL MAJOLICA	50	80	170	25	94	54
OLIVE JAR	98	100	158	12	105	73
Earthenware						
Green Lead Glazed	9	2	-	-	18	8
Lead Glazed Redware	39	78	124	14	36	39
Redware	-	-	-	-	-	-
Orange Micaceous	-	1	2	1	4	-
Mexican Red Painted	1	3	5	1	8	6
Quetzacoatl Ware	-	1	1	-	-	-
Fine Orange	-	-	10	-	5	9
Tonola	1	-	-	-	-	-
Indeterminate	3	3	4	1	1	-
TOTAL EARTHENWARE	53	88	146	17	72	62
ORIENTAL PORCELAIN	-	-	-	-	2	2
TOTAL EARTHENWARE PLUS PORCELAIN	53	88	146	17	74	64
TOTAL SPANISH INTRODUCED WARES	201	268	474	54	273	191
Indian Pottery (16th Century)						
St. John's Plain	1	5	3	1	-	-
St. John's Check Stamped	-	5	5	-	-	3
Rectilinear Comp. Stamped	17	11	71	-	9	3
Curvilinear Comp. Stamped	7	15	-	14	6	17
Plain	51	31	49	18	122	31
Incised	20	24	48	11	26	19
Punctated/Pinched/Applique	12	6	8	2	9	5
Cob Impressed	-	-	-	-	-	-
Simple Stamped	3	-	-	1	1	2
Check Stamped	2	-	-	-	2	3
Unidentified Stamped	20	29	37	21	-	42
Unidentifiable	92	145	230	47	27	67
TOTAL 16TH CENTURY INDIAN	225	271	451	115	202	192
TOTAL 16TH CENTURY CERAMICS	426	539	925	169	475	383
CHERT FRAGMENTS OR TOOLS	2	1	4	-	1	1
TRIANGULAR BIFACES	-	-	-	-	-	-
BURNISHING STONE	-	1	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	59A	59B	60A	61A	62A	63A
Majolica						
Columbia Plain	15	13	12	3	23	23
Gunmetal Columbia Plain	3	1	1	1	2	-
Yayal Blue on White	2	-	1	1	-	1
Santo Domingo Blue on White	3	-	3	-	4	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	1	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	11	5	2	1	1	-
Green Cylinder	5	2	7	-	6	3
Fine White	-	2	-	-	-	-
Indeterminate	51	38	57	15	17	13
TOTAL MAJOLICA	90	61	83	22	53	40
OLIVE JAR	134	151	168	38	40	59
Earthenware						
Green Lead Glazed	9	5	4	-	9	4
Lead Glazed Redware	42	30	36	15	22	27
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	4	5	1	1	1	-
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	-	3	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	8	-	13	-	1	1
TOTAL EARTHENWARE	63	43	54	16	33	32
ORIENTAL PORCELAIN	1	1	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	64	44	54	16	33	32
TOTAL SPANISH INTRODUCED WARES	288	256	305	76	126	131
Indian Pottery (16th Century)						
St. John's Plain	3	-	2	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	18	46	26	6	14	17
Curvilinear Comp. Stamped	25	-	5	-	-	-
Plain	29	40	24	13	18	40
Incised	39	32	59	12	11	13
Punctated/Pinched/Applique	4	4	6	1	2	2
Cob Impressed	1	3	4	-	-	-
Simple Stamped	5	-	-	2	-	-
Check Stamped	-	3	-	1	-	2
Unidentified Stamped	45	35	42	3	-	-
Unidentifiable	178	146	229	44	30	30
TOTAL 16TH CENTURY INDIAN	347	309	397	82	75	104
TOTAL 16TH CENTURY CERAMICS	635	565	702	158	201	235
CHERT FRAGMENTS OR TOOLS	3	1	-	-	-	-
TRIANGULAR BIFACES	-	-	-	-	-	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	63B	64A	64B	65A	65B	66A
Majolica						
Columbia Plain	24	35	1	36	18	24
Gunmetal Columbia Plain	1	28	-	30	29	31
Yayal Blue on White	1	5	-	-	1	3
Santo Domingo Blue on White	-	-	-	1	-	2
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	1	1	-
Isabela Polychrome	-	-	-	1	2	-
Santa Elena Blue on White	-	1	-	9	9	2
Green Cylinder	4	3	1	-	-	7
Fine White	-	-	-	-	-	1
Indeterminate	-	20	1	25	27	44
TOTAL MAJOLICA	30	92	3	103	87	114
OLIVE JAR	40	245	10	120	143	120
Earthenware						
Green Lead Glazed	4	2	1	3	2	1
Lead Glazed Redware	16	10	2	49	36	39
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	1	1	-	3	-	1
Quetzacoatl Ware	-	1	-	-	-	-
Fine Orange	-	6	-	-	1	-
Tonola	-	-	-	-	-	-
Indeterminate	-	4	-	5	2	-
TOTAL EARTHENWARE	21	24	3	60	41	41
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	21	24	3	60	41	41
TOTAL SPANISH INTRODUCED WARES	91	361	16	283	271	275
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	1	1
St. John's Check Stamped	-	-	-	-	1	1
Rectilinear Comp. Stamped	9	17	1	11	19	44
Curvilinear Comp. Stamped	-	4	1	-	6	-
Plain	16	36	4	26	27	39
Incised	1	18	-	17	11	9
Punctated/Pinched/Applique	3	5	1	-	3	9
Cob Impressed	-	-	-	-	-	-
Simple Stamped	1	2	2	-	-	-
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	-	-	-	-	-	-
Unidentifiable	31	38	2	34	52	17
TOTAL 16TH CENTURY INDIAN	61	120	11	88	120	120
TOTAL 16TH CENTURY CERAMICS	152	481	27	371	391	395
CHERT FRAGMENTS OR TOOLS	-	-	-	-	1	1
TRIANGULAR BIFACES	-	-	-	-	-	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	66B	67A	67B	69A	70A	71A
Majolica						
Columbia Plain	6	5	1	16	17	10
Gunmetal Columbia Plain	10	5	-	2	11	7
Yayal Blue on White	-	6	-	1	1	3
Santo Domingo Blue on White	-	-	-	-	1	1
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	2	-	1	-	5
Green Cylinder	1	-	3	-	3	4
Fine White	1	-	-	-	2	-
Indeterminate	8	8	-	22	26	27
TOTAL MAJOLICA	26	26	4	42	61	57
OLIVE JAR	30	51	16	53	133	154
Earthenware						
Green Lead Glazed	-	2	-	1	8	-
Lead Glazed Redware	5	22	1	25	38	23
Redware	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	-	-
Mexican Red Painted	1	-	-	2	4	6
Quetzacoatl Ware	-	-	-	-	-	-
Fine Orange	1	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	1	1	-	5	12	10
TOTAL EARTHENWARE	8	25	1	33	62	39
ORIENTAL PORCELAIN	-	-	-	-	-	1
TOTAL EARTHENWARE PLUS PORCELAIN	8	25	1	33	62	40
TOTAL SPANISH INTRODUCED WARES	64	102	21	128	256	251
Indian Pottery (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	1	-	-
Rectilinear Comp. Stamped	12	7	1	24	9	41
Curvilinear Comp. Stamped	-	3	-	2	7	3
Plain	10	21	6	32	20	36
Incised	3	4	-	28	10	60
Punctated/Pinched/Applique	2	1	1	4	3	4
Cob Impressed	-	-	-	-	1	1
Simple Stamped	2	1	-	2	3	1
Check Stamped	1	-	-	2	3	-
Unidentified Stamped	-	-	-	12	19	8
Unidentifiable	15	16	20	77	94	133
TOTAL 16TH CENTURY INDIAN	45	53	28	184	169	287
TOTAL 16TH CENTURY CERAMICS	109	155	49	312	425	538
CHERT FRAGMENTS OR TOOLS	-	-	5	-	3	-
TRIANGULAR BIFACES	-	-	1	-	-	-
BURNISHING STONE	-	-	-	-	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

PROVENIENCE	72A	73A
Majolica		
Columbia Plain	7	4
Gunmetal Columbia Plain	3	2
Yayal Blue on White	-	2
Santo Domingo Blue on White	2	-
Caparra Blue	-	-
Ichtucknee Blue on Blue	-	-
Isabela Polychrome	-	-
Santa Elena Blue on White	2	1
Green Cylinder	3	-
Fine White	-	-
Indeterminate	32	10
TOTAL MAJOLICA	49	19
OLIVE JAR	101	41
Earthenware		
Green Lead Glazed	3	2
Lead Glazed Redware	20	11
Redware	-	-
Orange Micaceous	-	-
Mexican Red Painted	2	-
Quetzacoatl Ware	-	-
Fine Orange	-	-
Tonola	-	-
Indeterminate	7	-
TOTAL EARTHENWARE	32	13
ORIENTAL PORCELAIN	1	-
TOTAL EARTHENWARE PLUS PORCELAIN	33	13
TOTAL SPANISH INTRODUCED WARES	183	73
Indian Pottery (16th Century)		
St. John's Plain	-	-
St. John's Check Stamped	-	-
Rectilinear Comp. Stamped	26	9
Curvilinear Comp. Stamped	2	-
Plain	43	10
Incised	55	13
Punctated/Pinched/Applique	3	-
Cob Impressed	4	1
Simple Stamped	2	1
Check Stamped	-	2
Unidentified Stamped	13	12
Unidentifiable	132	50
TOTAL 16TH CENTURY INDIAN	280	98
TOTAL 16TH CENTURY CERAMICS	463	171
CHERT FRAGMENTS OR TOOLS	1	-
TRIANGULAR BIFACES	-	-
BURNISHING STONE	-	-

APPENDIX IV

CERAMICS FROM 10' SQUARES IN FT. SAN FELIPE (38BU162G)

TYPE	COUNT	PERCENT TOTAL GROUP	PERCENT TOTAL SPANISH	PERCENT TOTAL CERAMIC
Majolica				
Columbia Plain	850	34.21	10.76	5.27
Gunmetal Columbia Plain	259	10.43	3.28	1.60
Yayal Blue on White	71	2.86	0.90	0.44
Santo Domingo Blue on White	46	1.85	0.58	0.28
Caparra Blue	-	0.00	0.00	0.00
Ichtucknee Blue on Blue	22	0.89	0.28	0.14
Isabela Polychrome	6	0.24	0.08	0.04
Santa Elena Blue on White	113	4.55	1.43	0.70
Green Cylinder	155	6.24	1.96	0.96
Fine White	21	0.85	0.27	0.13
Indeterminate	941	37.88	11.91	5.83
TOTAL MAJOLICA	2,484	100.00		15.39
OLIVE JAR	3,667	100.00	46.41	22.73
Earthenware				
Green Lead Glazed	152	8.75	1.92	0.94
Lead Glazed Redware	1,308	75.30	16.55	8.11
Redware	11	0.63	0.14	0.07
Orange Micaceous	9	0.52	0.11	0.06
Mexican Red Painted	80	4.61	1.01	0.50
Quetzacoatl Ware	4	0.23	0.05	0.02
Fine Orange	44	2.53	0.56	0.27
Tonola	1	0.06	0.01	0.01
Indeterminate	128	7.37	1.62	0.79
TOTAL EARTHENWARE	1,737	100.00		10.77
ORIENTAL PORCELAIN	14		0.17	0.09
TOTAL SPANISH INTRODUCED WARES	7,902	100.00	100.00	48.98
Indian Pottery (16th Century)				
St. John's Plain	28	0.34		0.17
St. John's Check Stamped	36	0.44		0.22
Rectilinear Comp. Stamped	922	11.20		5.72
Curvilinear Comp. Stamped	256	3.11		1.59
Plain	1,638	19.90		10.15
Incised	931	11.31		5.77
Punctated/Pinched/Applique	225	2.73		1.39
Cob Impressed	22	0.27		0.14
Simple Stamped	48	0.58		0.30
Check Stamped	36	0.44		0.22
Unidentified Stamped	476	5.78		2.95
Unidentifiable	3,614	43.90		22.40
TOTAL 16TH CENTURY INDIAN	8,232	100.00		51.02
TOTAL 16TH CENTURY CERAMICS	16,134	100.00		100.00

APPENDIX V

CERAMICS FROM THE SPANISH FEATURES IN FORT SAN FELIPE (38BU162G) USING A 1/8-INCH SCREEN

Key to Spanish Features Sifted through 1/8-inch Screen

146A	This is the central non-oystershell filled slump of a midden filled well below the topsoil zone. This feature represents the last deposit within the well shaft by the Spaniards. Flotation samples 238 and 242.
146B	This is the oystershell filled portion of the well shaft of midden filled well 146. This shaft was excavated only to the four foot depth. Flotation samples 240,243 and 246.
147	This is a Spanish midden filled pit near the southwest corner of the casa fuerte.
172	This is a replacement well hole for well 146, located five feet north of 146, having a lighter outer area and a humus and midden filled central area.
172A	This is a central humus filled area of Feature 172, which is a well hole. Flotation samples 251-253 are from here, with 252 2.5 ft. from the surface.
172B	The outer, whiter circle of fill around the central well shaft.
173	Casa fuerte posthole at the southwest corner. The top of this feature contained Spanish midden as did most of the casa fuerte postholes, representing the final fill into the slump of the hole. Below this was the deposit of lime lumps around the second post and below that the burned, charcoal faggot "smile" seen in the bottom of all the postholes for this structure.
198	Casa fuerte posthole at the west wall. The midden from this posthole came mainly from the upper part of the fill around the second post in the hole.

APPENDIX V

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE
(38BU162G) USING A 1/8" SCREEN

FEATURES	146A	146B	147	172
MAJOLICA				
Columbia Plain	8	11	4	2
Gunmetal Columbia Plain	-	-	-	-
Yayal Blue on White	-	9	-	-
Santo Domingo Blue on White	-	-	5	-
Caparra Blue	-	-	-	-
Ichtucknee Blue on Blue	-	1	-	-
Isabela Polychrome	-	-	-	1
Santa Elena Blue on White	-	-	-	-
Indeterminate	14	5	1	7
TOTAL MAJOLICA	22	26	10	10
OLIVE JAR	18	3	5	6
EARTHENWARE				
Green Lead Glazed	3	24	1	-
Lead Glazed Redware	23	-	24	6
Mexican Red Painted	-	-	-	-
Orange Micaceous	-	-	-	1
Feldspar Inlaid	-	-	-	-
Tonola	-	-	-	-
Indeterminate	5	6	3	-
TOTAL EARTHENWARE	31	30	28	7
ORIENTAL PORCELAIN	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	31	30	28	7
TOTAL SPANISH INTRODUCED WARES	71	59	43	23
INDIAN POTTERY (16th Century)				
St. John's Plain	-	-	-	-
St. John's Check Stamped	-	-	-	-
Rectilinear Comp. Stamped	3	6	2	1
Curvilinear Comp. Stamped	-	-	-	-
Plain	11	2	2	2
Incised	6	9	5	1
Punctated/Pinched/Applique	2	5	2	3
Cob Impressed	-	-	-	-
Simple Stamped	-	-	1	-
Check Stamped	-	-	-	-
Unidentified Stamped	-	5	4	-
Unidentifiable	3	2	1	7
TOTAL 16TH CENTURY INDIAN	25	29	17	14
TOTAL 16TH CENTURY CERAMICS	96	88	60	37

APPENDIX V

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE (38BU162G) USING A 1/8" SCREEN

FEATURES	172A	172B	173	198
MAJOLICA				
Columbia Plain	13	4	1	1
Gunmetal Columbia Plain	4	-	1	-
Yayal Blue on White	-	-	-	-
Santo Domingo Blue on White	2	-	-	-
Caparra Blue	-	-	1	-
Ichtucknee Blue on Blue	1	1	-	-
Isabela Polychrome	-	-	-	-
Santa Elena Blue on White	4	-	2	-
Indeterminate	7	6	1	1
TOTAL MAJOLICA	31	10	6	2
OLIVE JAR	50	10	10	-
EARTHENWARE				
Green Lead Glazed	1	-	-	-
Lead Glazed Redware	7	1	3	2
Mexican Red Painted	-	-	-	-
Orange Micaceous	1	-	-	-
Feldspar Inlaid	-	-	-	-
Tonola	-	-	-	-
Indeterminate	4	3	-	-
TOTAL EARTHENWARE	13	4	3	2
ORIENTAL PORCELAIN	1	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	14	4	3	2
TOTAL SPANISH INTRODUCED WARES	95	24	19	4
INDIAN POTTERY (16th Century)				
St. John's Plain	-	-	-	-
St. John's Check Stamped	-	-	-	-
Rectilinear Comp. Stamped	4	-	2	-
Curvilinear Comp. Stamped	1	-	1	3
Plain	2	3	3	2
Incised	3	3	5	1
Punctated/Pinched/Applique	1	-	-	-
Cob Impressed	-	-	-	-
Simple Stamped	-	-	-	-
Check Stamped	-	1	-	-
Unidentified Stamped	2	-	2	1
Unidentifiable	5	6	10	4
TOTAL 16TH CENTURY INDIAN	18	13	23	11
TOTAL 16TH CENTURY CERAMICS	113	37	42	15

APPENDIX V

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE (38BU162G) USING A 1/8" SCREEN

TYPE	Count	Ceramic Group Percent	Percent of Total Spanish Introduced Ceramics	Total Spanish/ Indian Percent
MAJOLICA				
Columbia Plain	44	37.6		
Gunmetal Columbia Plain	5	4.3		
Yayal Blue on White	9	7.7		
Santo Domingo Blue on White	7	6.0		
Caparra Blue	1	.8		
Ichtucknee Blue on Blue	2	1.7		
Isabela Polychrome	1	.8		
Santa Elena Blue on White	6	5.1		
Indeterminate	42	36.0		
TOTAL MAJOLICA	117	100.0	34.6	
OLIVE JAR	102		30.2	
EARTHENWARE				
Green Lead Glazed	29	24.4		
Lead Glazed Redware	66	55.5		
Mexican Red Painted	-	.0		
Orange Micaceous	2	1.7		
Feldspar Inlaid	-	.0		
Tonola	-	.0		
Indeterminate	21	17.6		
TOTAL EARTHENWARE	118		34.9	
ORIENTAL PORCELAIN	1	.8	.3	
TOTAL EARTHENWARE PLUS PORCELAIN	119	100.0		
TOTAL SPANISH INTRODUCED WARES	338		100.0	69.3
INDIAN POTTERY (16th Century)				
St. John's Plain	-	.0		
St. John's Check Stamped	-	.0		
Rectilinear Comp. Stamped	18	12.0		
Curvilinear Comp. Stamped	5	3.3		
Plain	27	18.0		
Incised	33	22.0		
Punctated/Pinched/Applique	13	8.7		
Cob Impressed	-	.0		
Simple Stamped	1	.7		
Check Stamped	1	.7		
Unidentified Stamped	14	9.3		
Unidentifiable	38	25.3		
TOTAL 16TH CENTURY INDIAN	150	100.0		30.7
TOTAL 16TH CENTURY CERAMICS	488			100.0

APPENDIX VI

CERAMICS FROM THE SPANISH FEATURES IN FORT SAN FELIPE (38BU162G) USING A 1/4-INCH SCREEN

Key to Spanish Features Sifted Through 1/4-Inch Screen

148	Central area of a *casa fuerte* posthole.
164	Small midden pit adjacent to midden filled well 146.
190	Moat for Ft. San Felipe (same as moat fill 202).
198	*Casa fuerte* posthole at west edge of *casa fuerte*.
217	Well hole at northwest corner of *casa fuerte* ditch.
220	Spanish postmold within a posthole at north edge of *casa fuerte*.
222-229	Ten foot sections of the *casa fuerte* ditch 175.
237	*Casa fuerte* posthole at the northwest corner.
239	Backfilled soil in a *casa fuerte* posthole at 148 and 170.
241B	Topmost level of midden filled well 146, above 146A and 146B.
244	*Casa fuerte* ditch (175) in north wall of *casa fuerte*.

APPENDIX VI

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE
(38BU162G) USING A 1/4" SCREEN

FEATURES	148	164	190	198
MAJOLICA				
Columbia Plain	-	-	-	-
Gunmetal Columbia Plain	-	-	-	-
Yayal Blue on White	-	-	-	-
Santo Domingo Blue on White	-	-	-	-
Caparra Blue	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-
Isabela Polychrome	-	-	-	-
Santa Elena Blue on White	-	-	-	-
Indeterminate	1	-	-	-
TOTAL MAJOLICA	1	-	-	-
OLIVE JAR	6	2	-	1
EARTHENWARE				
Green Lead Glazed	-	-	-	-
Lead Glazed Redware	1	-	-	-
Mexican Red Painted	-	-	-	-
Orange Micaceous	-	-	-	-
Feldspar Inlaid	-	-	-	-
Tonola	-	-	-	-
Indeterminate	3	-	-	-
TOTAL EARTHENWARE	4	-	-	-
ORIENTAL PORCELAIN	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	4	-	-	-
TOTAL SPANISH INTRODUCED WARES	11	2	-	1
INDIAN POTTERY (16th Century)				
St. John's Plain	-	-	-	-
St. John's Check Stamped	-	-	-	-
Rectilinear Comp. Stamped	-	-	1	-
Curvilinear Comp. Stamped	-	-	-	-
Plain	11	-	-	-
Incised	4	-	-	-
Punctated/Pinched/Applique	-	-	-	1
Cob Impressed	-	-	-	-
Simple Stamped	1	-	-	1
Check Stamped	-	-	-	-
Unidentified Stamped	-	-	-	2
Unidentifiable	12	-	1	5
TOTAL 16TH CENTURY INDIAN	28	-	2	9
TOTAL 16TH CENTURY CERAMICS	39	2	2	10

APPENDIX VI

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE
(38BU162G) USING A 1/4" SCREEN

FEATURES	217	220	222	224	225	226
MAJOLICA						
Columbia Plain	7	-	2	3	-	-
Gunmetal Columbia Plain	-	-	-	-	-	-
Yayal Blue on White	-	-	1	1	-	-
Santo Domingo Blue on White	1	-	-	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	3	-	-	-
Indeterminate	17	1	1	1	2	3
TOTAL MAJOLICA	25	1	7	5	2	3
OLIVE JAR	54	-	2	2	3	2
EARTHENWARE						
Green Lead Glazed	1	-	-	-	1	1
Lead Glazed Redware	2	1	1	1	-	-
Mexican Red Painted	-	-	-	-	-	-
Orange Micaceous	-	-	-	-	5	-
Feldspar Inlaid	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	24	2	-	-	-	-
TOTAL EARTHENWARE	27	3	1	2	6	1
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	27	3	1	2	6	1
TOTAL SPANISH INTRODUCED WARES	106	4	10	9	11	6
INDIAN POTTERY (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	1	-	3	1	12	-
Curvilinear Comp. Stamped	-	-	4	-	-	1
Plain	6	3	3	8	10	9
Incised	4	-	2	2	4	-
Punctated/Pinched/Applique	-	-	1	-	2	3
Cob Impressed	-	-	-	1	-	-
Simple Stamped	-	-	-	-	-	-
Check Stamped	-	-	-	3	-	1
Unidentified Stamped	-	-	2	3	5	2
Unidentifiable	15	2	17	25	34	31
TOTAL 16TH CENTURY INDIAN	26	5	32	43	67	47
TOTAL 16TH CENTURY CERAMICS	132	9	42	50	78	53

APPENDIX VI

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE (38BU162G) USING A 1/4" SCREEN

FEATURES	227	228	237	239	241B	244
MAJOLICA						
Columbia Plain	-	-	-	-	-	-
Gunmetal Columbia Plain	-	-	-	-	-	-
Yayal Blue on White	-	-	-	-	-	-
Santo Domingo Blue on White	-	-	-	-	-	-
Caparra Blue	-	-	-	-	-	-
Ichtucknee Blue on Blue	-	-	-	-	-	-
Isabela Polychrome	-	-	-	-	-	-
Santa Elena Blue on White	-	-	-	-	-	-
Indeterminate	1	-	-	-	3	-
TOTAL MAJOLICA	1	-	-	-	3	-
OLIVE JAR	4	2	-	-	10	-
EARTHENWARE						
Green Lead Glazed	-	1	-	-	-	-
Lead Glazed Redware	5	1	-	-	8	-
Mexican Red Painted	-	-	-	-	-	-
Orange Micaceous	1	-	-	-	-	-
Feldspar Inlaid	-	-	-	-	-	-
Tonola	-	-	-	-	-	-
Indeterminate	-	2	-	1	-	-
TOTAL EARTHENWARE	6	4	-	1	8	-
ORIENTAL PORCELAIN	-	-	-	-	-	-
TOTAL EARTHENWARE PLUS PORCELAIN	6	4	-	1	8	-
TOTAL SPANISH INTRODUCED WARES	11	6	-	1	21	-
INDIAN POTTERY (16th Century)						
St. John's Plain	-	-	-	-	-	-
St. John's Check Stamped	-	-	-	-	-	-
Rectilinear Comp. Stamped	1	3	-	-	-	-
Curvilinear Comp. Stamped	1	7	-	-	-	-
Plain	9	8	1	-	1	1
Incised	-	4	-	-	-	-
Punctated/Pinched/Applique	-	2	-	-	1	-
Cob Impressed	-	-	-	-	-	-
Simple Stamped	-	1	1	-	-	-
Check Stamped	-	-	-	-	-	-
Unidentified Stamped	3	3	2	-	-	-
Unidentifiable	9	43	3	-	1	1
TOTAL 16TH CENTURY INDIAN	23	71	7	-	3	2
TOTAL 16TH CENTURY CERAMICS	34	77	7	1	24	2

APPENDIX VI

CERAMICS FROM SPANISH FEATURES IN FT. SAN FELIPE (38BU162G) USING A 1/4" SCREEN

TYPE	Count	Ceramic Group Percent	Percent of Total Spanish Introduced Ceramics	Total Spanish/ Indian Ceramic Percent
MAJOLICA				
Columbia Plain	12	25.0		
Gunmetal Columbia Plain	-	.0		
Yayal Blue on White	2	4.2		
Santo Domingo Blue on White	1	2.0		
Caparra Blue	-	.0		
Ichtucknee Blue on Blue	-	.0		
Isabela Polychrome	-	.0		
Santa Elena Blue on White	3	6.3		
Indeterminate	30	62.5		
TOTAL MAJOLICA	48	100.0	24.1	
OLIVE JAR	88		44.2	
EARTHENWARE				
Green Lead Glazed	4	6.2		
Lead Glazed Redware	21	32.3		
Mexican Red Painted	-	.0		
Orange Micaceous	6	9.2		
Feldspar Inlaid	-	.0		
Tonola	-	.0		
Indeterminate	32	52.3		
TOTAL EARTHENWARE	63		31.7	
ORIENTAL PORCELAIN	-	.0		
TOTAL EARTHENWARE PLUS PORCELAIN	63	100.0		
TOTAL SPANISH INTRODUCED WARES	199		100.0	35.3
INDIAN POTTERY (16th Century)				
St. John's Plain	-	.0		
St. John's Check Stamped	-	.0		
Rectilinear Comp. Stamped	22	6.5		
Curvilinear Comp. Stamped	13	2.7		
Plain	70	19.8		
Incised	20	5.3		
Punctated/Pinched/Applique	10	2.7		
Cob Impressed	1	.3		
Simple Stamped	4	1.1		
Check Stamped	4	1.1		
Unidentified Stamped	22	5.9		
Unidentifiable	199	54.6		
TOTAL 16TH CENTURY INDIAN	365	100.0		64.7
TOTAL 16TH CENTURY CERAMICS	564			100.0

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	2A	2B	3A	4A	5A	5B
Glass	-	-	-	-	-	-
Olive Jar	5	2	2	3	13	5
Majolica	3	-	2	2	11	4
Earthenware	2	1	3	3	8	6
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	10	3	7	8	32	15
Spikes	-	-	-	-	1	1
Nails	-	1	-	-	1	1
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	1	-
TOTAL ARCHITECTURE	-	1	-	-	3	2
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	-
Lead sprue	-	-	-	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	-	-	-	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	-	-	-
Chicora	18	6	8	7	15	22
TOTAL ABORIGINAL	18	6	8	7	15	22
TOTAL ARTIFACTS	28	10	15	15	50	39

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	6A	7A	7B	8A	8B	9A
Glass	-	-	-	-	-	-
Olive Jar	31	4	5	5	6	19
Majolica	12	4	6	12	-	14
Earthenware	21	3	14	3	9	6
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	64	11	25	20	15	39
Spikes	2	-	-	-	-	-
Nails	-	-	-	1	-	-
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	2	-	-	1	-	-
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	2
Lead sprue	-	-	-	-	-	1
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	-	-	-	3
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	-	-	-
Chicora	15	8	12	8	9	8
TOTAL ABORIGINAL	15	8	12	8	9	8
TOTAL ARTIFACTS	81	19	37	29	24	50

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	9B	10A	10B	11A	12A	12B
Glass	-	-	-	-	-	-
Olive Jar	14	24	15	2	11	8
Majolica	6	34	19	6	5	11
Earthenware	11	19	7	3	4	4
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	31	77	41	11	20	23
Spikes	-	1	-	-	-	1
Nails	-	2	1	-	-	-
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	-	3	1	-	-	1
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	1	-	-	-	-	-
Lead sprue	-	1	1	1	1	1
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	1	1	1	1	1	1
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	1	-	-	1	-
Chicora	9	34	6	9	21	16
TOTAL ABORIGINAL	9	35	6	9	22	16
TOTAL ARTIFACTS	41	116	49	21	43	41

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	13A	13B	14A	15A	16A	16B
Glass	-	-	-	-	-	-
Olive Jar	37	6	2	2	20	14
Majolica	8	2	1	12	16	17
Earthenware	6	6	1	2	5	4
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	51	14	4	16	41	35
Spikes	1	-	-	1	-	-
Nails	-	-	-	-	-	-
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	1	-	-	1	-	-
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	1
Lead sprue	-	-	-	1	-	1
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	-	1	-	2
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	-	-	-
Chicora	14	4	8	19	9	5
TOTAL ABORIGINAL	14	4	8	19	9	5
TOTAL ARTIFACTS	66	18	12	37	50	42

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	17A	18A	20A	21A	22A	22B
Glass	-	-	-	-	-	-
Olive Jar	5	39	14	9	11	-
Majolica	15	28	9	9	2	1
Earthenware	2	3	13	5	-	-
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	22	70	36	23	13	1
Spikes	2	2	-	-	-	-
Nails	-	-	-	-	2	-
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	2	2	-	-	2	-
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	-
Lead sprue	-	-	1	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	1	-	-	-	-
TOTAL ARMS	-	1	1	-	-	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	1	-	-	-
Chicora	4	25	34	12	24	2
TOTAL ABORIGINAL	4	25	35	12	24	2
TOTAL ARTIFACTS	28	98	72	35	39	3

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	23A	23B	24A	25A	26A	27A
Glass	1	-	-	-	-	-
Olive Jar	10	-	2	6	27	3
Majolica	4	-	-	3	19	-
Earthenware	3	-	1	4	7	-
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	18	-	3	13	53	3
Spikes	1	-	1	-	2	-
Nails	-	-	1	-	-	-
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	1	-	2	-	2	-
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	1	-
Lead sprue	-	-	1	-	1	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	1	-	2	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	-	-	-
Chicora	19	22	9	9	17	-
TOTAL ABORIGINAL	19	22	9	9	17	-
TOTAL ARTIFACTS	38	22	15	22	74	3

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	28A	29A	29B	30A	30B	31A
Glass	-	-	-	-	1	-
Olive Jar	5	4	1	36	30	2
Majolica	5	2	-	13	3	-
Earthenware	6	2	1	5	5	-
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	16	8	2	54	39	2
Spikes	-	-	-	1	1	-
Nails	1	-	-	1	-	1
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	1	-	-	2	1	1
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	-
Lead sprue	-	-	-	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	-	-	-	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	-	-	-
Chicora	8	11	54	39	36	3
TOTAL ABORIGINAL	8	11	54	39	36	3
TOTAL ARTIFACTS	25	19	56	95	76	6

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	33A	34A	35A	36A
Glass	-	-	-	-
Olive Jar	19	1	7	-
Majolica	7	-	4	-
Earthenware	5	-	3	-
Porcelain	-	-	-	-
TOTAL KITCHEN	31	1	14	-
Spikes	-	-	-	-
Nails	-	1	1	-
Tacks	-	-	-	-
Pintel	-	-	-	-
TOTAL ARCHITECTURE	-	1	1	-
TOTAL FURNITURE	-	-	-	-
Lead shot	-	-	1	-
Lead sprue	-	-	-	-
Cannonball	-	-	-	-
Crossbow bolt point	-	-	-	-
TOTAL ARMS	-	-	1	-
Tobacco pipe	-	-	-	-
TOTAL TOBACCO	-	-	-	-
Pins/brass	-	-	-	-
Pins/iron	-	-	-	-
Aglets	-	-	-	-
Bordado	-	-	-	-
TOTAL CLOTHING	-	-	-	-
Copper stars (Asterisks)	-	-	-	-
Coins	-	-	-	-
Beads	-	-	-	-
TOTAL PERSONAL	-	-	-	-
Barrel band	-	-	-	-
Unidentified object	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-
St. Johns	-	-	-	-
Chicora	31	8	21	5
TOTAL ABORIGINAL	31	8	21	5
TOTAL ARTIFACTS	62	10	37	5

APPENDIX VII

ARTIFACTS FROM 3' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

Type	Total Count	Percentage
KITCHEN GROUP ARTIFACTS (domestic)		
Glass	2	0.11
Olive Jar	486	27.41
Majolica	331	18.67
Earthenware	216	12.19
Porcelain	-	0.00
KITCHEN TOTAL	1,035	58.38
ARCHITECTURE GROUP ARTIFACTS		
Spikes	18	1.01
Nails	15	0.85
Tacks	-	0.00
Pintel	1	0.06
ARCHITECTURE TOTAL	34	1.92
FURNITURE GROUP ARTIFACTS	-	-
ARMS GROUP ARTIFACTS		
Lead shot	6	0.33
Lead sprue	11	0.62
Cannonball	-	0.00
Crossbow bolt point	1	0.06
ARMS TOTAL	18	1.01
TOBACCO PIPE GROUP ARTIFACTS		
Tobacco pipe	-	0.00
TOBACCO PIPE TOTAL	-	0.00
CLOTHING GROUP ARTIFACTS		
Pins/brass	-	0.00
Pins/iron	-	0.00
Aglets	-	0.00
Bordado	-	0.00
CLOTHING TOTAL	-	0.00
PERSONAL GROUP ARTIFACTS		
Copper stars (asterisks)	-	0.00
Coins	-	0.00
Beads	-	0.00
PERSONAL GROUP TOTAL	-	0.00
ACTIVITIES GROUP ARTIFACTS		
Barrel band	-	0.00
Unidentified object	-	0.00
ACTIVITIES GROUP TOTAL	-	0.00
St. Johns	3	0.17
Chicora	683	38.52
TOTAL ABORIGINAL	686	38.69
TOTAL ARTIFACTS	1,773	100.00

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	38A	39A	40A	41A	42A	43A
Glass	-	-	1	-	-	-
Olive Jar	24	22	36	31	40	58
Majolica	31	32	35	17	31	30
Earthenware	13	18	19	9	20	20
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	68	72	91	57	91	108
Spikes	1	-	2	-	-	1
Nails	2	2	-	1	-	1
Tacks	1	-	1	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	4	2	3	1	-	2
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	-
Lead sprue	1	-	1	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	1	-	1	-	-	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	1	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	1	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	1	-	-	-	-	-
TOTAL PERSONAL	1	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	1	1	1	-	-	4
Chicora	145	127	127	81	169	180
TOTAL ABORIGINAL	145	128	128	81	169	184
TOTAL ARTIFACTS	220	203	223	139	260	294

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	44A	44B	45A	45B	46A	46B
Glass	-	-	-	-	1	-
Olive Jar	20	37	65	19	103	18
Majolica	15	18	27	21	53	5
Earthenware	22	6	25	13	65	9
Porcelain	-	-	-	-	2	-
TOTAL KITCHEN	57	61	117	53	224	32
Spikes	-	-	-	-	-	-
Nails	-	2	5	2	5	-
Tacks	4	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	4	2	5	2	5	-
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	2	-	1	1	-
Lead sprue	-	-	-	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	2	-	1	1	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	1	1	6	5	2	-
Chicora	108	121	205	159	348	99
TOTAL ABORIGINAL	109	122	211	164	350	99
TOTAL ARTIFACTS	170	187	333	220	580	131

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	47A	48A	48B	49A	50A	51A
Glass	1	-	-	-	1	-
Olive Jar	143	20	51	37	30	90
Majolica	55	15	20	11	30	114
Earthenware	64	13	14	3	27	72
Porcelain	2	1	-	-	-	-
TOTAL KITCHEN	265	49	85	51	88	276
Spikes	-	-	-	-	2	5
Nails	2	1	1	-	1	3
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	2	1	1	-	3	8
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	-	-
Lead sprue	-	-	-	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	-	-	-	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	1	-
Coins	-	-	-	-	-	-
Beads	1	-	-	1	-	-
TOTAL PERSONAL	1	-	-	1	1	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	3	-	-	-	1	3
Chicora	368	40	139	192	144	296
TOTAL ABORIGINAL	371	40	139	192	145	299
TOTAL ARTIFACTS	639	90	225	244	237	583

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	52A	52B	53A	53B	54A	54B
Glass	-	-	2	-	1	-
Olive Jar	123	8	88	114	65	32
Majolica	135	12	48	106	61	27
Earthenware	66	4	46	66	32	9
Porcelain	-	-	-	-	-	1
TOTAL KITCHEN	324	24	184	286	159	69
Spikes	7	-	3	6	5	4
Nails	3	-	1	6	2	1
Tacks	1	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	11	-	4	12	7	5
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	2	2	-
Lead sprue	-	-	-	1	-	-
Cannonball	-	-	1	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	1	3	2	-
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	1	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	1	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	1	-	-	-	-	1
Chicora	219	13	110	144	131	102
TOTAL ABORIGINAL	220	13	110	144	131	103
TOTAL ARTIFACTS	556	37	299	445	299	177

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	55A	56A	57A	57B	58A	58B
Glass	2	-	2	1	-	-
Olive Jar	98	100	158	12	105	73
Majolica	50	80	170	25	94	54
Earthenware	53	88	146	17	72	62
Porcelain	-	-	-	-	2	2
TOTAL KITCHEN	203	268	476	55	273	191
Spikes	-	-	7	-	2	-
Nails	2	5	11	2	-	5
Tacks	2	1	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	4	6	18	2	2	5
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	1	4	6	-	-	-
Lead sprue	1	1	1	-	1	1
Cannonball	-	-	-	-	-	1
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	2	5	7	-	1	2
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	1
Beads	3	-	-	-	-	-
TOTAL PERSONAL	3	-	-	-	-	1
Barrel band	-	1	-	-	-	1
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	1	-	-	-	1
St. Johns	1	10	8	1	-	3
Chicora	224	261	443	114	202	189
TOTAL ABORIGINAL	225	271	451	115	202	192
TOTAL ARTIFACTS	437	550	952	172	478	392

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	59A	59B	60A	61A	62A	63A
Glass	-	-	-	-	4	-
Olive Jar	134	151	168	38	40	59
Majolica	90	61	83	22	53	40
Earthenware	63	43	54	16	33	32
Porcelain	1	1	-	-	-	-
TOTAL KITCHEN	288	256	305	76	130	131
Spikes	-	-	-	-	2	2
Nails	5	4	2	3	-	-
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	5	4	2	3	2	2
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	1	-	-	-
Lead sprue	-	1	-	-	-	-
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	1
Serpentine Fragment	1	-	-	-	-	-
TOTAL ARMS	1	1	1	-	-	1
Tobacco pipe	-	2	-	-	-	-
TOTAL TOBACCO	-	2	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	-	-
TOTAL PERSONAL	-	-	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	1	-	-	-	-	1
TOTAL ACTIVITIES	1	-	-	-	-	1
St. Johns	3	-	2	-	-	-
Chicora	344	309	395	82	75	104
TOTAL ABORIGINAL	347	309	397	82	75	104
TOTAL ARTIFACTS	642	572	705	161	207	239

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	63B	64A	64B	65A	65B	66A
Glass	-	-	1	-	1	-
Olive Jar	40	245	10	120	143	120
Majolica	30	92	3	103	87	114
Earthenware	21	24	3	60	41	41
Porcelain	-	-	-	-	-	-
TOTAL KITCHEN	91	361	17	283	272	275
Spikes	2	7	-	1	3	4
Nails	2	-	-	1	-	3
Tacks	-	-	-	-	-	-
Pintel	-	-	-	-	-	-
TOTAL ARCHITECTURE	4	7	-	2	3	7
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	-	-	-	1	1
Lead sprue	-	-	-	-	1	1
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-	-
TOTAL ARMS	-	-	-	-	2	2
Tobacco pipe	-	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-	-
Pins/brass	-	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	-	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	1	-	-	-	-
TOTAL PERSONAL	-	1	-	-	-	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	-	2	2
Chicora	61	120	11	88	118	118
TOTAL ABORIGINAL	61	120	11	88	120	120
TOTAL ARTIFACTS	157	489	28	373	397	404

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	66B	67A	67B	69A	70A	71A
Glass	-	-	-	-	-	-
Olive Jar	30	51	16	53	133	154
Majolica	26	26	4	42	61	57
Earthenware	8	25	1	33	62	39
Porcelain	-	-	-	-	-	1
TOTAL KITCHEN	64	102	21	128	256	251
Spikes	-	1	-	2	-	1
Nails	-	-	1	3	2	1
Tacks	1	-	-	-	-	1
Pintel	-	-	-	-	-	1
TOTAL ARCHITECTURE	1	1	1	5	2	4
TOTAL FURNITURE	-	-	-	-	-	-
Lead shot	-	1	-	-	2	2
Lead sprue	-	-	-	1	1	1
Cannonball	-	-	-	-	-	-
Crossbow bolt point	-	1	-	-	-	-
TOTAL ARMS	-	2	-	1	3	3
Tobacco pipe	-	-	-	-	-	1
TOTAL TOBACCO	-	-	-	-	-	1
Pins/brass	1	-	-	-	-	-
Pins/iron	-	-	-	-	-	-
Aglets	-	-	-	-	-	-
Bordado	-	-	-	-	-	-
TOTAL CLOTHING	1	-	-	-	-	-
Copper stars (Asterisks)	-	-	-	-	-	-
Coins	-	-	-	-	-	-
Beads	-	-	-	-	2	-
TOTAL PERSONAL	-	-	-	-	2	-
Barrel band	-	-	-	-	-	-
Unidentified object	-	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-	-
St. Johns	-	-	-	1	-	-
Chicora	45	53	28	183	169	287
TOTAL ABORIGINAL	45	53	28	184	169	287
TOTAL ARTIFACTS	111	158	50	318	432	546

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE
ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

PROVENIENCE	72A	73A
Glass	-	-
Olive Jar	101	41
Majolica	49	19
Earthenware	32	13
Porcelain	1	-
TOTAL KITCHEN	183	73
Spikes	1	-
Nails	-	2
Tacks	-	-
Pintel	-	-
TOTAL ARCHITECTURE	1	2
TOTAL FURNITURE	-	-
Lead shot	-	-
Lead sprue	1	-
Cannonball	-	-
Crossbow bolt point	-	-
TOTAL ARMS	1	-
Tobacco Pipe	-	-
TOTAL TOBACCO	-	-
Pins/brass	-	-
Pins/iron	-	-
Aglets	-	-
Bordado	-	-
TOTAL CLOTHING	-	-
Copper stars (Asterisks)	-	-
Coins	-	-
Beads	1	-
TOTAL PERSONAL	1	-
Barrel band	-	-
Unidentified object	-	-
TOTAL ACTIVITIES	-	-
St. Johns	-	-
Chicora	280	98
TOTAL ABORIGINAL	280	98
TOTAL ARTIFACTS	466	173

APPENDIX VIII

ARTIFACTS FROM 10' SQUARES IN FT. SAN FELIPE ORGANIZED USING THE CAROLINA PATTERN MODEL (38BU162G)

Type	Total Count	Percentage	
KITCHEN GROUP ARTIFACTS (domestic)			
Glass	18	0.11	
Olive Jar	3,667	22.36	
Majolica	2,484	15.15	
Earthenware	1,737	10.09	
Porcelain	14	0.09	
KITCHEN TOTAL	7,920		48.30
ARCHITECTURE GROUP ARTIFACTS			
Spikes	71	0.43	
Nails	95	0.58	
Tacks	12	0.07	
Pintel	1	0.01	
ARCHITECTURE TOTAL	179		1.09
FURNITURE GROUP ARTIFACTS	-	-	
ARMS GROUP ARTIFACTS			
Lead shot	27	0.16	
Lead sprue	15	0.09	
Cannonball	2	0.01	
Crossbow bolt point	2	0.01	
Serpentine Fragment	1	0.01	
ARMS TOTAL	47		0.28
TOBACCO PIPE GROUP ARTIFACTS			
Tobacco pipe	3	0.02	
TOBACCO PIPE TOTAL	3		0.02
CLOTHING GROUP ARTIFACTS			
Pins/brass	2	0.01	
Pins/iron	1	0.01	
Aglets	-	0.00	
Bordado	-	0.00	
CLOTHING TOTAL	3		0.02
PERSONAL GROUP ARTIFACTS			
Copper stars (asterisks)	1	0.01	
Coins	1	0.01	
Beads	10	0.06	
PERSONAL GROUP TOTAL	12		0.08
ACTIVITIES GROUP ARTIFACTS			
Barrel band	2	0.01	
Unidentified object	2	0.01	
ACTIVITIES GROUP TOTAL	4		0.02
St. Johns	64	0.39	
Chicora	8,168	49.80	
TOTAL ABORIGINAL	8,232		50.19
TOTAL ARTIFACTS	16,400	100.00	100.00

APPENDIX IX

ARTIFACTS FROM THE SPANISH FEATURES IN FORT SAN FELIPE (38BU162G) ORGANIZED USING THE CAROLINA PATTERN MODEL AND A 1/8-INCH SCREEN

Key to Spanish Features Sifted through 1/8-inch Screen

146A	This is the central non-oystershell filled slump of a midden filled well below the topsoil zone. This feature represents the last deposit within the well shaft by the Spaniards. Flotation samples 238 and 242.
146B	This is the oystershell filled portion of the well shaft of midden filled well 146. This shaft was excavated only to the four foot depth. Flotation samples 240,243 and 246.
147	This is a Spanish midden filled pit near the southwest corner of the casa fuerte.
172	This is a replacement well hole for well 146, located five feet north of 146, having a lighter outer area and a humus and midden filled central area.
172A	This is a central humus filled area of Feature 172, which is a well hole. Flotation samples 251-253 are from here, with 252 2.5 ft. from the surface.
172B	The outer, whiter circle of fill around the central well shaft.
173	Casa fuerte posthole at the southwest corner. The top of this feature contained Spanish midden as did most of the casa fuerte postholes, representing the final fill into the slump of the hole. Below this was the deposit of lime lumps around the second post and below that the burned, charcoal faggot "smile" seen in the bottom of all the postholes for this structure.
198	Casa fuerte posthole at the west wall. The midden from this posthole came mainly from the upper part of the fill around the second post in the hole.

APPENDIX IX

ARTIFACTS FROM THE SPANISH FEATURES IN
FORT SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/8" SCREEN

FEATURE NUMBER	146A	146B	147	172
Glass	-	-	1	2
Olive Jar	18	3	5	6
Majolica	22	26	10	10
Earthenware	31	30	28	7
Porcelain	-	-	-	-
TOTAL KITCHEN	71	59	44	25
Spikes	1	2	1	-
Nails	2	12	1	2
Tacks	7	2	2	-
Pintel	-	-	-	-
TOTAL ARCHITECTURE	10	16	4	2
TOTAL FURNITURE	-	-	-	-
Lead shot	-	-	-	-
Lead sprue	-	-	-	-
Cannonball	-	-	-	-
Crossbow bolt point	-	-	-	-
TOTAL ARMS	-	-	-	-
Tobacco pipe	-	-	-	-
TOTAL TOBACCO	-	-	-	-
Pins/brass	6	4	1	10
Pins/iron	2	3	-	-
Aglets	7	2	-	2
Bordado	-	-	-	-
Hook/Eye	-	1	-	3
TOTAL CLOTHING	15	10	1	15
Cópper stars (Asterisks)	-	-	-	-
Coins	-	-	-	-
Beads	2	-	-	-
Ornaments	-	1	1	-
TOTAL PERSONAL	2	1	1	-
Barrel band	-	-	-	-
Unidentified object	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-
St. Johns	-	-	-	-
Chicora	25	29	17	14
TOTAL ABORIGINAL	25	29	17	14
TOTAL ARTIFACTS	123	115	67	56

APPENDIX IX

ARTIFACTS FROM THE SPANISH FEATURES IN
FORT SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/8" SCREEN

FEATURE NUMBER	172A	172B	173	198
Glass	1	-	1	-
Olive Jar	50	10	10	-
Majolica	31	10	6	2
Earthenware	13	4	3	2
Porcelain	1	-	-	-
TOTAL KITCHEN	96	24	20	4
Spikes	2	-	-	-
Nails	2	1	-	1
Tacks	-	-	-	-
Pintel	-	-	-	-
TOTAL ARCHITECTURE	4	1	-	1
TOTAL FURNITURE	-	-	-	-
Lead shot	-	-	-	1
Lead sprue	-	-	-	-
Cannonball	-	-	-	-
Crossbow bolt point	-	-	-	-
TOTAL ARMS	-	-	-	1
Tobacco pipe	-	-	-	-
TOTAL TOBACCO	-	-	-	-
Pins/brass	10	4	1	1
Pins/iron	2	1	1	-
Aglets	1	-	-	2
Bordado	-	-	-	1
Hook/Eye	2	-	-	-
TOTAL CLOTHING	15	5	2	4
Copper stars (Asterisks)	-	-	-	-
Coins	-	-	-	-
Beads	-	-	-	1
Ornaments	-	-	-	-
TOTAL PERSONAL	-	-	-	1
Barrel band	-	-	-	-
Unidentified object	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-
St. Johns	-	-	-	-
Chicora	18	13	23	11
TOTAL ABORIGINAL	18	13	23	11
TOTAL ARTIFACTS	133	43	45	22

APPENDIX IX

ARTIFACTS FROM THE SPANISH FEATURES IN
FT. SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/8" SCREEN

Type	Total Count	Percentage	
KITCHEN GROUP ARTIFACTS (domestic)			
Glass	5	.83	
Olive Jar	102	16.89	
Majolica	117	19.37	
Earthenware	118	19.53	
Porcelain	1	.17	
KITCHEN TOTAL	343		56.79
ARCHITECTURE GROUP ARTIFACTS			
Spikes	6	.99	
Nails	21	.48	
Tacks	11	1.82	
Pintel	-	.00	
ARCHITECTURE TOTAL	38		6.29
FURNITURE GROUP ARTIFACTS	-	-	.00
ARMS GROUP ARTIFACTS			
Lead shot	1	.17	
Lead sprue	-	.00	
Cannonball	-	.00	
Crossbow bolt point	-	.00	
ARMS TOTAL	1		.17
TOBACCO PIPE GROUP ARTIFACTS			
Tobacco pipe	-	.00	
TOBACCO PIPE TOTAL	-		.00
CLOTHING GROUP ARTIFACTS			
Pins/brass	37	6.13	
Pins/iron	9	1.49	
Aglets	14	2.31	
Bordado	1	.17	
Hook and Eye	6	.99	
CLOTHING TOTAL	67		11.09
PERSONAL GROUP ARTIFACTS			
Copper stars (asterisks)	-	.00	
Coins	-	.00	
Beads	3	.50	
Ornaments	2	.33	
PERSONAL GROUP TOTAL	5		.83
ACTIVITIES GROUP ARTIFACTS			
Barrel band	-	.00	
Unidentified object	-	.00	
ACTIVITIES GROUP TOTAL	-	.00	
St. Johns	-	.00	
Chicora	150	24.83	
TOTAL ABORIGINAL	150		24.83
TOTAL ARTIFACTS	604		100.00

APPENDIX X

ARTIFACTS FROM THE SPANISH FEATURES IN FORT SAN FELIPE (38BU162G) ORGANIZED USING THE CAROLINA PATTERN MODEL AND A 1/4-INCH SCREEN

Key to Spanish Features Sifted Through 1/4-Inch Screen

148	Central area of a casa fuerte posthole.
164	Small midden pit adjacent to midden filled well 146.
190	Moat for Ft. San Felipe (same as moat fill 202).
197	Burned corncob feature above casa fuerte posthole 198.
198	Casa fuerte posthole at west edge of casa fuerte.
217	Well hole at northwest corner of casa fuerte ditch.
220	Spanish postmold within a posthole at north edge of casa fuerte.
222-229	Ten foot sections of the casa fuerte ditch 175.
237	Casa fuerte posthole at the northwest corner.
239	Backfilled soil in a casa fuerte posthole at 148 and 170.
241B	Topmost level of midden filled well 146, above 146A and 146B.
244	Casa fuerte ditch (175) in north wall of casa fuerte.

APPENDIX X

ARTIFACTS FROM THE SPANISH FEATURES IN
FORT SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/4" SCREEN

FEATURE NUMBER	148	164	190	197	198
Glass	-	-	-	-	-
Olive Jar	6	2	-	-	1
Majolica	1	-	-	-	-
Earthenware	4	-	-	-	-
Porcelain	-	-	-	-	-
TOTAL KITCHEN	11	2	-	-	1
Spikes	2	-	-	-	-
Nails	2	-	-	-	1
Tacks	-	-	-	-	-
Pintel	-	-	-	-	-
TOTAL ARCHITECTURE	4	-	-	-	1
TOTAL FURNITURE	-	-	-	-	-
Lead shot	1	-	-	-	-
Lead sprue	2	-	-	-	-
Cannonball	-	-	-	-	-
Crossbow bolt point	-	-	-	-	-
TOTAL ARMS	3	-	-	-	-
Tobacco pipe	-	-	-	-	-
TOTAL TOBACCO	-	-	-	-	-
Pins/brass	2	-	-	1	-
Pins/iron	-	-	-	-	-
Aglets	-	-	-	-	1
Bordado	-	-	-	-	-
Hook/Eye	-	-	-	-	-
TOTAL CLOTHING	2	-	-	1	1
Copper stars (Asterisks)	-	-	-	-	-
Beads	-	-	-	-	-
Ornaments	-	-	-	-	-
Die	1	-	-	-	-
Bone Pin/Awl	-	-	-	-	-
TOTAL PERSONAL	1	-	-	-	-
Barrel band	-	-	-	-	-
Unidentified objects	-	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-	-
St. Johns	-	-	-	-	-
Chicora	28	-	2	-	9
TOTAL ABORIGINAL	28	-	2	-	9
TOTAL ARTIFACTS	49	2	2	1	12

APPENDIX X

ARTIFACTS FROM THE SPANISH FEATURES IN
FORT SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/4" SCREEN

FEATURE NUMBER	217	220	222	224
Glass	-	1	-	-
Olive Jar	54	-	2	2
Majolica	25	1	7	5
Earthenware	27	3	1	2
Porcelain	-	-	-	-
TOTAL KITCHEN	106	5	10	9
Spikes	2	-	1	1
Nails	13	-	-	-
Tacks	-	-	-	1
Pintel	-	-	-	-
TOTAL ARCHITECTURE	15	-	1	2
TOTAL FURNITURE	-	-	-	-
Lead shot	3	-	-	1
Lead sprue	-	-	-	-
Cannonball	-	-	-	-
Crossbow bolt point	-	-	-	-
TOTAL ARMS	3	-	-	1
Tobacco pipe	-	-	-	-
TOTAL TOBACCO	-	-	-	-
Pins/brass	1	-	-	-
Pins/iron	-	-	-	-
Aglets	-	-	-	-
Bordado	-	-	-	-
Hook/Eye	-	-	-	-
TOTAL CLOTHING	1	-	-	-
Copper stars (Asterisks)	-	-	-	-
Beads	-	-	-	-
Ornaments	-	-	-	-
Die	-	-	-	-
Bone Pin/Awl	-	-	-	-
TOTAL PERSONAL	-	-	-	-
Barrel band	-	-	-	-
Unidentified objects	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-
St. Johns	-	-	-	-
Chicora	26	5	32	43
TOTAL ABORIGINAL	26	5	32	43
TOTAL ARTIFACTS	151	10	43	55

APPENDIX X

ARTIFACTS FROM THE SPANISH FEATURES IN
FORT SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/4" SCREEN

FEATURE NUMBER	225	226	227	228
Glass	-	-	-	-
Olive Jar	3	2	4	2
Majolica	2	3	1	-
Earthenware	6	1	6	4
Porcelain	-	-	-	-
TOTAL KITCHEN	11	6	11	6
Spikes	1	-	1	-
Nails	-	-	-	1
Tacks	-	-	-	-
Pintel	-	-	-	-
TOTAL ARCHITECTURE	1	-	1	1
TOTAL FURNITURE	-	-	-	-
Lead shot	-	-	-	-
Lead sprue	-	-	-	-
Cannonball	-	-	-	-
Crossbow bolt point	-	-	-	-
TOTAL ARMS	-	-	-	-
Tobacco pipe	-	-	-	-
TOTAL TOBACCO	-	-	-	-
Pins/brass	-	-	-	-
Pins/iron	-	-	-	-
Aglets	-	-	-	-
Bordado	-	-	-	-
Hook/Eye	-	-	-	-
TOTAL CLOTHING	-	-	-	-
Copper stars (Asterisks)	-	-	-	-
Beads	-	-	-	-
Ornaments	1	-	-	-
Die	-	-	-	-
Bone Pin/Awl	1	-	-	-
TOTAL PERSONAL	2	-	-	-
Barrel band	-	-	-	-
Unidentified objects	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-
St. Johns	-	-	-	-
Chicora	67	47	23	71
TOTAL ABORIGINAL	67	47	23	71
TOTAL ARTIFACTS	81	53	35	78

APPENDIX X

ARTIFACTS FROM THE SPANISH FEATURES IN
FORT SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/4" SCREEN

FEATURE NUMBER	237	239	241B	244
Glass	-	-	-	-
Olive Jar	-	-	10	-
Majolica	-	-	3	-
Earthenware	-	1	8	-
Porcelain	-	-	-	-
TOTAL KITCHEN	-	1	21	-
Spikes	-	-	-	-
Nails	4	-	6	-
Tacks	-	-	-	-
Pintel	-	-	-	-
TOTAL ARCHITECTURE	4	-	6	-
TOTAL FURNITURE	-	-	-	-
Lead shot	-	-	-	-
Lead sprue	-	-	-	-
Cannonball	-	-	-	-
Crossbow bolt point	-	-	-	-
TOTAL ARMS	-	-	-	-
Tobacco pipe	-	-	-	-
TOTAL TOBACCO	-	-	-	-
Pins/brass	-	-	-	-
Pins/iron	-	-	-	-
Aglets	1	-	-	-
Bordado	-	-	-	-
Hook/Eye	-	-	-	-
TOTAL CLOTHING	1	-	-	-
Copper stars (Asterisks)	-	-	-	-
Beads	-	-	-	-
Ornaments	-	-	-	-
Die	-	-	-	-
Bone Pin/Awl	-	-	-	-
TOTAL PERSONAL	-	-	-	-
Barrel band	-	-	-	-
Unidentified objects	-	-	-	-
TOTAL ACTIVITIES	-	-	-	-
St. Johns	-	-	-	-
Chicora	7	-	3	2
TOTAL ABORIGINAL	7	-	3	2
TOTAL ARTIFACTS	12	1	30	2

APPENDIX X

ARTIFACTS FROM THE SPANISH FEATURES IN
FT. SAN FELIPE (38BU162G) ORGANIZED USING
THE CAROLINA PATTERN MODEL AND A 1/4" SCREEN

Type	Total Count	Percentage	
KITCHEN GROUP ARTIFACTS (domestic)			
Glass	1	.16	
Olive Jar	88	14.27	
Majolica	48	7.78	
Earthenware	63	10.21	
Porcelain	-	.00	
KITCHEN TOTAL	200		32.42
ARCHITECTURE GROUP ARTIFACTS			
Spikes	8	1.30	
Nails	27	4.38	
Tacks	1	.16	
Pintel	-	.00	
ARCHITECTURE TOTAL	36		5.84
FURNITURE GROUP ARTIFACTS	-	-	.00
ARMS GROUP ARTIFACTS			
Lead shot	5	.81	
Lead sprue	2	.32	
Cannonball	-	.00	
Crossbow bolt point	-	.00	
ARMS TOTAL	7		1.13
TOBACCO PIPE GROUP ARTIFACTS	-		.00
CLOTHING GROUP ARTIFACTS			
Pins/brass	4	.65	
Pins/iron	-	.00	
Aglets	2	.32	
Bordado	-	.00	
Hook and Eye	-	.00	
CLOTHING TOTAL	6		.97
PERSONAL GROUP ARTIFACTS			
Copper stars (asterisks)	-	.00	
Beads	-	.00	
Ornaments	1	.16	
Die	1	.16	
Bone Pin/Awl	1	.16	
PERSONAL GROUP TOTAL	3		.48
ACTIVITIES GROUP ARTIFACTS			
Barrel band	-	.00	
Unidentified object	-	.00	
ACTIVITIES GROUP TOTAL	-	.00	
St. Johns	-	.00	
Chicora	365	59.16	
TOTAL ABORIGINAL	365		59.16
TOTAL ARTIFACTS	617		100.00

APPENDIX XI

ANALYSIS OF VERTEBRATE REMAINS FROM SANTA ELENA: 1983 EXCAVATIONS

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ABSTRACT

Vertebrate remains from Santa Elena, South Carolina, were excavated by Stanley South in 1983. Faunal remains were studied from several features excavated within Fort San Felipe. A combination of chemical flotation and screening was used to recover the materials. Both 1/8-inch and 1/4-inch screens were used. A total of 110 individuals represented by 2,914 bones weighing 1,322.03 gms were identified from these deposits. Analysis of these data confirms a pattern otherwise described for sixteenth-century Spanish Florida, but suggests that soldiers eating in the fort had greater access to domestic meat sources and other rare foodstuffs than did people who deposited animal remains elsewhere in the town.

Spanish Subsistence

Santa Elena was founded in 1566 on what is today known as Parris Island in Port Royal Sound, South Carolina. This was part of the Spanish colonial effort in North America. Although the capital of Spanish Florida until 1587, the town was abandoned twice during its brief history, once in 1576 and again in 1587. For its own defense against hostile aboriginals and French colonial intentions, a series of forts were associated with the town. The first of these was known as Fort San Felipe (1572-1576), followed by Fort San Marcos (1577-1587). Fort San Felipe was the focus of excavations by Stanley South in 1983. Data for the vertebrate faunal remains recovered during this excavation are reported here.

A total of 429 vertebrate individuals have been identified in archaeological collections excavated in 1979, 1981, and 1982 from Santa Elena (South 1980, 1982, 1983). The materials examined from the 1979 excavations

were from a midden-filled pit beside the door of a small hut and a large oystershell pit to the east of that hut. The 1981 faunal remains were from pits associated with several structures which formed a quadrangle. These could be separated into components which had a high Spanish/aboriginal artifact ratio and those which had a low Spanish/aboriginal artifact ratio. The faunal materials examined from the excavations in 1982 were from pits located north of Structure 5, part of the quadrangle excavated in 1981. During these excavations a combination of 1/4-inch and 1/8-inch screen was used to recover artifacts.

Several characteristics seem to distinguish deposits excavated from Santa Elena prior to 1983 (Table 1). The faunal materials from these excavations are very similar to Spanish samples from St. Augustine (Reitz 1980, 1982b, 1983, 1983c). Domestic animals were somewhat more extensively used at Santa Elena. However, only 12% of the individuals were domestic species, and of these 54% were chickens. There is some evidence that chickens were luxury goods at St. Augustine (Geiger 1937), but the heavy and widespread use of chickens at Santa Elena makes this questionable. The consumption of laying hens was not uncommon at Santa Elena, although this seems an improvident thing to do. Roosters were also consumed. Only one cow and 13 pigs have been identified out of 429 individuals. The pigs were often either juveniles or subadults rather than mature individuals at death. No sheep or goats have been identified from Santa Elena, although one individual has been identified at St. Augustine. Wild terrestrial animals were not exploited extensively. Only 7% of the individuals were wild terrestrial animals. Wild birds contributed 4% of the individuals while aquatic reptiles contributed 6% of the individuals. Diamondback terrapins alone constituted 3% of the Santa Elena individuals. Cartilaginous and bony fishes were the largest faunal category, contributing 67% of the individuals identified. Three families were extensively exploited. Sea catfishes contributed 22% of the individuals, drums 21%, and mullets 8%. Small drum species constituted 2% of the drums identified. There were no other small fishes identified in the Santa Elena collection, so these small fishes formed less than 1% of the total collection as well.

Several interesting observations have been made in addition to these. Data from the previous excavations provided some evidence for differences in subsistence efforts along socio-economic lines. The 1980 excavations contained faunal remains as well as cultural materials which seemed to be associated with a higher status than the materials excavated from an area associated with a hut in 1979. The 1980 data from the quadrangle contained the only two cow bones identified from Santa Elena prior to 1983. A higher use of chickens and pigs was also found in the quadrangle area compared to the hut area. Fishes formed a lower percentage of the individuals in the quadrangle deposits than in the 1979 or 1982 deposits. Wild individuals formed a major part of the sample from all contexts, however. The sample from 1982 was the largest one studied from Santa Elena. The materials appeared to be intermediate between the hut and the quadrangle in terms of indicating socio-economic status, but served to indicate the uniqueness of the quadrangle data for Santa Elena as a whole.

Based upon these data it appears that subsistence at Santa Elena differed from that at St. Augustine in several respects (Table 1). While wild resources, particularly estuarine species, were extensively exploited in

both towns, domestic livestock was somewhat more abundant in the Spanish diet at Santa Elena than at St. Augustine. Fourteen cows, 38 pigs, and 1 caprine have been identified out of 1,094 individuals at St. Augustine. Chickens contributed 46% of the domestic individuals. Although wild terrestrial resources were less extensively exploited at Santa Elena than at St. Augustine, turkeys were more commonly used at Santa Elena than at St. Augustine, and deer were used to about the same degree at both places. The main reason wild terrestrial resources appear to have been more extensively exploited at St. Augustine is that at St. Augustine, Spaniards (but not aboriginals) exploited gopher tortoises (Gopherus polyphemus) extensively. Gopher tortoises formed 32% of the wild terrestial species exploited at St. Augustine and 3% of all individuals identified in sixteenth-century species lists from St. Augustine. Spaniards at St. Augustine utilized wild birds more than did Spaniards at Santa Elena, and tended to exploit a wider variety of wild birds, including herons, ducks, owls, hawks, quail, rails, sandpipers, doves and a variety of passerine birds. Aquatic reptiles, primarily the diamondback terrapin (Malaclemys terrapin), were more extensively used at Santa Elena. Fish were generally somewhat less exploited at Santa Elena than at St. Augustine, but small fishes were not utilized extensively at either town by comparison to aboriginal diets in the coastal region.

When Spanish diet is compared to the aboriginal one several characteristics are seen (Table 2). One of these is that Spaniards seem to have utilized more birds than did aboriginals living on the coast. Spaniards apparently did not exploit small fishes to the same extent as did aboriginals (Reitz 1983). This last observation must be tempered by the knowledge that while use of fine screens to recover data from aboriginal sites on the coast is not common, it is even less common to use fine screens at historic sites. Consequently small fish generally stand a better chance to be recovered during excavations at prehistoric sites than during excavations at historic sites. Neither aboriginals nor Spaniards exploited turtles to any great extent on the coast. The one exception to this is the high use made by Spaniards at St. Augustine of gopher tortoise. Both Spaniards and aboriginals generally emphasized deer in the types of wild terrestrial animals used. Although Spaniards did exploit domestic species more than aboriginals did, Spaniards did not exploit domestic species as extensively as would be anticipated.

The current knowledge of subsistence at Santa Elena is based upon excavations within the town. Much of the population at Santa Elena had military duties. While few soldiers may actually have lived in the fort, many must have spent long hours there, and must have taken their meals at the fort rather than in the town itself. The vertebrate remains, therefore, probably represent meals consumed by soldiers on duty at the fort rather than off-duty in the village. It is true, of course, that some of the vertebrate material from this year's work was found in contexts such as moats, ditches, and postholes. These materials could have been deposited originally someplace else and then utilized as building materials in the construction of the fort when the need arose. It is not known to what extent this type of activity could have mixed fort and non-fort deposits. Much of this year's sample came from wells, however, and it is assumed here that the bulk of the faunal materials were deposited inside the fort by soldiers working in the fort rather than deposited outside the fort. If

that is the case, then the materials excavated from Fort San Felipe in 1983 represent an opportunity to compare the diets of civilians or off-duty soldiers with the diet of soldiers on duty.

Materials and Methods

excavations at santa elena, south carolina, were conducted by stanley south of the institute of archeology and anthropology, university of south Carolina, in 1983. Faunal materials were recovered from within Fort San Felipe during this year's fieldwork. A list of the features from which faunal remains were studied is presented in Appendix A. Faunal remains in nine of the features were recovered using 1/8-inch screen. The remaining materials were recovered using 1/4-inch screen.

Standard zooarchaeological methods were used during identification and analysis. The identifications were done by H. Catherine Brown using the comparative skeletal collection of the Zooarchaeology Laboratory at the University of Georgia. She was assisted in this work by Marc Frank. Bones of all taxa were weighed and counted in order to determine relative abundance of the species identified. Notes were made of any modifications to the bones and of the elements identified. Measurements were recorded following Driesch (1976) for avian bones. The maximum width of fish atlas centra were also recorded. Minimum Numbers of Individuals (MNI) were determined using paired elements, size, and age as criteria. In calculating MNI, several archaeological proveniences were combined and others were considered apart. Features 173, 197, 198, 222, 223, 224, 225, 226, 227, 228, 229, and 237 were combined to form Feature 175 as these were numbers which distinguished between segments of a single, long feature, or were postholes and postmolds within that feature. Feature 175 was the ditch running along the west side of the casa fuerte. Field specimen numbers 146A, 146B, 238, 240, 241B, 242, 243, and 246 were combined as Feature 146. Field specimen number 241A was not combined with Feature 146 since it was above the well (Feature 146). Field specimen numbers 251 and 252 were combined with 149, 172, 172A, and 172B into Feature 172. Postholes 148 and 239 were combined into a single analytical unit as postholes inside the casa fuerte. The two moat features, 202 and 202B, were combined. Features 217, 147, 220, 203, and 241A were treated as spearate events and were not combined with any other features.

Although MNI is the standard zooarchaeological quantification medium, the measure has several problems. MNI is an index which emphasizes small species over large ones. A faunal collection may have 10 mullet individuals and only one deer, based on MNI. It seems unlikely that the catfish contributed more meat than did the deer, however. Further, MNI is based upon the assumption that the entire animal was utilized at the site. This ignores a basic facet of human behavior: exchange or trade. This is a particularly important problem when dealing with historic samples where marketing of processed meat products was substantial, but the exact extent unknown. In addition to these problems, MNI is based upon paired elements. A large quantity of unpaired elements such as mullet vertebrae and drum teeth are usually interpreted as only one individual, regardless of how

many fragments of these elements may be observed. The manner in which these data from the archaeological proveniences is aggregated during analysis also substantially influences MNI results (Grayson 1979). Some elements are simply more easily identified than others and these taxa represented by these elements may appear more significant in the species list than they were in the daily diet.

In additon to MNI, bone count, and bone weight, an estimate of biomass provides information on the quantity of meat supplied by the identified species. In some cases the original live weight or size of the animal can also be estimated. The predictions are based upon the allometric principle that the proportions of body mass, skeletal mass, and skeletal dimensions change with increasing size. This scale effect results from a need to compensate for weakness in the basic structural materials, in this case, bone. The relationship between body weight and skeletal weight is described by the allometric equation:

$$Y = aX^b$$

(Simpson et al. 1960: 397). Many biological phenomena show allometry in accordance with this law (Gould 1966, 1971). In this equation X is the skeletal weight or a linear dimension of the bones, Y is the quantity of meat or the total live weight, b is the constant of allometry (the slope of the line), and a is the Y-intercept for a log-log plot using the method of least squares regression and the best fit line (Casteel 1978; Wing and Brown 1979; Reitz 1982a; Reitz and Cordier 1983). A given quantity of bone or a specific skeletal dimension represents a predictable amount of tissue due to the effects of allometric growth. Values for a and b are obtained from calculations based upon data at the Florida State Museum, University of Florida. The allometric formulae used here are presented in Table 3.

Allometry is used to predict two distinct values. One of these is kilograms of meat represented by kilograms of bone where X is archaeological bone weight. This is a conservative estimate of biomass determined from the faunal materials actually recovered from the site. (The term "biomass" is used to refer to the results of this calculation.) Biomass reflects the probability that only certain portions of the animal were used at the site. This would be the case where preserved meats or redistributed meat was consumed. On the other hand, when X is a linear measurement of a skeletal dimension such as defined by Driesch (1976) for mammals and birds, scaling predicts the total live weight or total length of the animal. The total live weight estimate is used to assess the size of livestock and fish. It does not imply that the entire animal was consumed. At the moment linear allometric formulae are available only for some drum elements and mammalian astragalus, so that no predictions could be made.

Both MNI and biomass calculations are subject to sample size bias. In samples of less than 200 individuals or 1,400 bones, the sample is undoubtedly too small for reliable interpretations (Grayson 1979; Wing and Brown 1979). With small samples the species list is too short, and the abundance of one species in relationship to others is probably somewhat inaccurate. It is not possible to determine the nature or extent of the bias, or correct for it, until the sample is made larger through additional work.

The age of the species identified was estimated by observing the degree of epiphysial fusion for selected elements. When animals are young their bones are not fully formed. Along the area of growth the shaft and the end of the bone, or epiphysis, are not fused. When growth is complete the shaft and epiphysis fuse. Elements fuse in a regular temporal sequence (Silver 1963; Schmid 1972; Gilbert 1980), although environmental factors influence the actual age at which fusion is complete. Fusion rates can be grouped into four general categories. Bones identified were noted as either fused or unfused in the age category where fusion normally occurs. This is most successful for unfused bones which fuse in the first year or so of life, and for fused bones which complete growth at three or four years of age. Intermediate bones are more difficult to interpret. An element which fuses before or at 18 months of age and is found fused archaeologically, could be from an animal which died immediately after fusion was complete or many years later. The ambiguity inherent in age grouping is reduced somewhat by recording each element under the oldest category possible. In the case of Santa Elena data, few elements were appropriate for this method.

In order to summarize the Santa Elena data, the species list has been reduced to a summary table based upon vertebrate class and gross habitat preference. Wild terrestrial animals include all wild mammals. Domestic mammals include the pig (Sus scrofa) and cow (Bos taurus). The chicken (Gallus gallus) is the only domestic bird. All of the turtles are either aquatic or marine in habitat, except the gopher tortoise (Gopherus polyphemus). This is a terrestrial species which is classified with the other wild terrestrial species. Commensal species include the rodents, and amphibians. Many species of these groups have been consumed by human populations; however, they are also found associated with human residences and could easily be introduced into the archaeological assemblage by accident. This is the interpretation given to them here.

Results

The results of identification indicate heavy exploitation of estuarine resources with minimal use of wild mammals, domestic animals, or of wild birds (Tables 4 and 5). The sample size falls below the 200 individuals necessary for an adequate sample; however, the 1983 collection is similar to assemblages excavated from elsewhere at Santa Elena and may, therefore, be a reasonable example of a soldier's diet. In spite of the general similarity with samples excavated from Santa Elena in previous years, this sample does show some interesting differences: a higher use of domestic mammals and birds; the presence of two more cow individuals; and the use of a resource not previously identified in Santa Elena deposits. This new species was the gopher tortoise (Gopherus polyphemus).

Based on Minimum Numbers of Individuals the species used at Santa Elena were primarily estuarine fishes (Table 5). Nonetheless, domestic animals were more prominent in the collection from the fort than in the faunal assemblages from other locations within Santa Elena except the quadrangle excavated in 1981. Chickens (Gallus gallus) comprised 7% of the

individuals, which is the second highest value from Santa Elena, just below the 11% figure found in the quadrangle. The only other cow (Bos taurus) identified from Santa Elena was also found at the quadrangle, and the level of hog (Sus scrofa) use was 6% at both the quadrangle and the fort. It was 5% and 4% in the collections from 1979 and 1982. The level of wild terrestrial use in the collection from the fort is lower than that in the collection from the quadrangle; in fact, it is identical to that in the collection from the hut excavated in 1979. This does not really reflect the situation accurately. Although one mink (Mustela vision) was also included in this category, the main wild terrestrial species were gopher tortoise (Gopherus polyphemus) and deer (Odocoileus virginianus). Gophers are terrestrial tortoises which are found in well-drained sandy ridge and sand dune habitats (Carr 1952). While their range extends along the coastal plain from southeastern South Carolina to extreme southeastern Texas, they are most abundant and typical of the high pine woods of peninsular Florida and of the sand dunes in the vicinity of St. Augustine. The town of Ridgeland, in Jasper County, South Carolina, was formerly known as Gopher Hill and still holds a Gopher Hill Festival each year at which gophers are featured (Zenie Ingram, personal communication to Stanley South, 1983) and there are other recent reports of gophers in other areas of Jasper County. These animals probably were a rare item in the Spanish diet at Santa Elena, however. Deer were not as extensive in the fort faunal assemblage as in other collections at Santa Elena. Use of deer is at the same level as in the 1979 hut excavations. One major area of difference found in the fort materials is the high use of wild birds. The level of wild bird use is even higher in this sample from Ft. San Felipe than from previous excavations at Santa Elena and from St. Augustine, where wild birds are a common aspect of faunal assemblages. The types of species used, however, are those found in St. Augustine. Use of aquatic reptiles is lower than at all of the Santa Elena collections, except that from the hut, from which no aquatic reptiles were identified. The level of fish and shark exploitation reflected in the fort collection is very close to that in the quadrangle collection. Both of these faunal assemblages had fewer fish in them than did the hut or the village collections of 1979 and 1982.

Biomass estimates indicate the extent to which domestic species were important in the diet. Far more biomass was estimated for the fort assemblage than for any other context at Santa Elena. The quadrangle collection had 29.7% of the biomass contributed by domestic animals. On the other hand the percentage of biomass from wild terrestrial animals was the lowest of the three collections for which biomass has been calculated. (The collection from the hut was considered to be too small for this method to be informative.) The percentage of wild terrestrial biomass in the 1982 village collection was 25% and in the quadrangle collection it was 44.4%. The quadrangle figures reflect the large quantity of deer found in those deposits. The percentage of fishes and sharks in the fort collection was lower than that in the village collection, but higher than the quadrangle collection (42.6% and 20.0% respectively).

Bone modifications were almost exclusively confined to burning (Table 6). None of the bones had been gnawed by dogs and only one had been gnawed by rodents. One of the bones had been sawed. This was a shaft fragment from a mammal. Sawed bones are quite rare in sixteenth-century contexts although they have been found from St. Augustine, at SA 26-1 (Reitz and

Scarry 1982). Based on several lines of evidence, SA 26-1 was interpreted as an upper status site. Several of the mammal and bird bones had been hacked as with a cleaver and some had been cut as with a knife. Many of the fish bones had been burned.

As has been observed at other sites, most of the identified mammalian elements are from the head and feet (Table 7). The mink was identified from a mandible as was the rabbit. One of the Cricetidae individuals was a Cricetinae and the other was a Microtinae based on teeth.

Very little data could be collected on the age, sex, and size of the animals since so few teeth and limb bones were included in the collection. All of the deer and cow bones were from animals over 18 months of age, except for a decidious premolar from a deer indicating at least one individual under 18 months. Five of the pig bones were from animals over 18 months of age and two were from an animal younger than that. Two of the pig individuals were sub-adults based on a decidious lower fourth premolar and an unfused distal tibia. One of the deer individuals was a sub-adult based on a decidious lower fourth premolar. Both of the cow individuals were probably adults, although the elements identified, a tooth and a cuneiform, do not provide good evidence for this. The rabbit and mink were probably adults. All of the bird bones were from adults. Four of the chicken and two of the unidentified bird bones were from laying hens based on the presence of medullary bone (rick 1975). one of the birds was a rooster. no evidence for sexual characteristics were observed in the mammalian bones. measurements are presented in table 8. the fishes exploited were primarily larger than individuals found in aboriginal sites.

Discussion

Since 1979, vertebrate faunal remains from a variety of contexts have been examined from Santa Elena. The excavations in 1983 inside Fort San Felipe provide data on the subsistence activities of men on duty at the fort. This information provides an interesting contrast to data obtained from excavations in the town of Santa Elena itself. People in the town of Santa Elena seemed to subsist largely on local wild animals, primarily fish. Domestic animals utilized were primarily chickens, with pigs rare and cows even less common. Fish and pork were main protein sources in the diet.

Several interesting aspects of the soldiers' diet appear in the faunal record from Fort San Felipe. Several gopher tortoises were consumed. These animals may have been captured on Parris Island or brought to the town from areas where the habitat was more suitable. This could either have been from the mainland of what is now Jasper County, South Carolina, or from further south. It could be that the soldiers collected these while on patrols in habitats suitable for gophers; or that they obtained them from local Indians supplying the town with foodstuffs; or that the gophers were sent up by Spaniards further south. The soldiers also appear to have consumed more wild birds than did other members of the town. It is tempting to speculate that this was because of the soldiers' access to guns.

The soldiers also consumed more domestic meat than was the case at other locations in Santa Elena. This may be a reflection of rations being consumed in the fort. This possibility raises the question of the soldiers relationship with the town. It is possible that soldiers ate a different diet when in the fort than when in the village. It is possible that soldiers did live in the fort rather than in the village, or at least took their main meal in the fort rather than in the village where they might sleep and consume other foods.

The similarity between the fort and quadrangle faunal collections is quite interesting. Prior to this year's work, it seemed probable that the quadrangle was occupied by higher status individuals than the other areas of Santa Elena. It may be that the quadrangle and the fort areas were occupied by people who enjoyed a similar status in the community. Soldiers and administrators might have obtained different food supplies from those that other townsfolk received. Occupants of both areas seem to have had similar access to resources which were different from those enjoyed by other residents of the town. These resources included domestic animals and gopher tortoises.

In most respects the Santa Elena data from 1983 excavations confirm a developing style of Spanish subsistence on the coast. This style includes a greater use of wild birds and of large fish individuals than is found in aboriginal sites. Nonetheless the species exploited are those also exploited by aboriginals in the area. It also is characterized by limited use of turtles and domestic livestock. Among the livestock used, over 40% of the individuals were chickens and cattle are very rare. Fish provided most of the biomass, followed by venison and pork.

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TABLE 1

COMPARISON OF MINIMUM NUMBERS OF INDIVIDUALS
BY TYPES OF ANIMALS FOR SPANISH FLORIDA

	St. Augustine		Santa Elena		Spanish Florida	
	#	%	#	%	#	%
Domestic Animals	99	9.1	52	12.1	151	9.9
Wild Terrestrial Animals	107	9.8	30	7.0	137	9.0
Wild Birds	68	6.2	19	4.4	87	5.7
Aquatic Reptiles	24	2.2	24	5.6	48	3.2
Snakes	6	0.6	1	0.2	7	0.5
Fish and Sharks	747	68.3	286	66.7	1033	67.8
Commensal Species	43	3.9	17	4.0	60	3.9
TOTAL MNI	1094		429		1523	

TABLE 2

COMPARISON OF SPANISH AND ABORIGINAL
USE OF VERTEBRATE FAUNA

	Spanish Deposits		Aboriginal Deposits	
	#	%	#	%
Domestic Animals	151	9.9	1	0.06
Wild Terrestrial Animals	137	9.0	212	12.5
Cetacea			2	0.1
Wild Birds	87	5.7	22	1.3
Aquatic Reptiles	48	3.2	95	5.6
Snakes	7	0.5	27	1.6
Fish and Sharks	1033	67.8	1267	74.7
Commensal Species	60	3.9	71	4.2
TOTAL	1523		1697	

TABLE 3

SANTA ELENA: ALLOMETRIC VALUES USED IN THIS STUDY

	N	loga	b	r^2
Mammal	97	1.12	0.90	0.94
Bird	307	1.04	0.91	0.97
Turtle	26	0.51	0.67	0.55
Snake	26	1.17	1.01	0.97
Chondrichthyes	17	1.68	0.86	0.85
Osteichthyes	393	0.90	0.81	0.80
Non-Perciformes	119	0.85	0.79	0.88
Siluriformes	36	1.15	0.95	0.87
Perciformes	274	0.93	0.83	0.76
Sparidae	22	0.96	0.92	0.98
Sciaenidae	99	0.81	0.74	0.73
Pleuronectiformes	21	1.09	0.89	0.95

TABLE 4

SANTA ELENA, SPECIES LIST

	COUNT	MNI		WT., gms	BIOMASS	
		#	%		kg	%
Ud Mammal	445	0		421.8	7.16	40.5
Sylvilagus spp. Rabbit	2	1	0.9	1.6	0.04	0.2
Cricetidae New World mice	7	2	1.8	0.1	0.003	0.02
Sigmodon hispidus Hispid Cotton Rat	1	1	0.9	0.1	0.003	0.02
Mustela vision Mink	1	1	0.9	0.6	0.02	0.1
Artiodactyl	7	0		35.6	0.69	3.9
Sus scrofa Pig	22	6	5.5	57.8	1.19	6.7
Odocoileus virginianus Deer	7	5	4.6	21.9	0.466	2.6
Bos taurus Cow	2	2	1.8	10.1	0.23	1.3
Ud Bird	172	0		50.61	0.8303	4.7
Anas spp. Duck	2	1	0.9	2.4	0.05	0.3
Branta canadensis Canada goose	2	1	0.9	0.5	0.01	0.06
Colinus virginianus Quail	1	1	0.9	0.1	0.003	0.02
Gallus gallus Chicken	38	8	7.3	23.9	0.415	2.3
Meleagris gallopavo Turkey	1	1	0.9	0.3	0.007	0.04
Rallidae Rails	1	1	0.9	0.1	0.003	0.02

TABLE 4 (Cont.)

SANTA ELENA, SPECIES LIST

	COUNT	MNI		WT., gms	BIOMASS	
		#	%		kg	%
Scolopacidae Sandpipers	6	4	3.6	0.5	0.014	0.08
Gallinago gallinago Common snipe	1	1	0.9	0.1	0.003	0.02
Laridae Gulls	1	1	0.9	0.5	0.01	0.06
Columbidae cf. Zenaida Macroura Turtle dove	2	1	0.9	0.1	0.003	0.02
Muscicapidae Warblers	1	1	0.9	0.1	0.003	0.02
Ud Turtle	142	0		63.9	0.937	5.3
Kinosternon subrudrum Mud turtle	1	1	0.9	0.1	0.007	0.04
Emydidae	4	0		1.0	0.037	0.2
Malaclemys terrapin Diamondback terrapin	11	3	2.7	6.4	0.15	0.9
Gopherus polyphemus Gopher tortoise	3	3	2.7	3.9	0.10	0.6
Colubridae Non-poisonous snakes	3	3	2.7	0.3	0.003	0.02
Ud Amphibian	2	0		0.02		
Rana spp./Bufo spp. Frog/toad	1	1	0.9	0.1		
Carcharhinidae Requiem shark	12	3	2.7	1.1	0.16	0.9
Ud Fish	1293	0		184.8	2.69	15.2
Ariidae Sea catfishes	329	0		41.0	0.728	4.1

TABLE 4 (Cont.)

SANTA ELENA, SPECIES LIST

	COUNT	MNI		WT., gms	BIOMASS	
		#	%		kg	%
Arius felis Hardhead catfish	185	17	15.5	43.6	0.750	4.2
Bagre marinus Gafftopsail catfish	18	8	7.3	2.6	0.046	0.3
Pomatomus saltatrix Bluefish	1	2	1.8	0.1	0.004	0.02
Archosargus probatocephalus Sheepshead	22	6	5.5	8.3	0.121	0.7
Sciaenidae Drums	24	0		5.2	0.16	0.9
Cynoscion spp. Seatrout	22	3	2.7	1.6	0.067	0.4
Pogonias Cromis Black drum	17	6	5.5	4.8	0.157	0.9
Sciaenops ocellatus Red drum	24	5	4.6	12.8	0.297	1.7
Mugil spp. Mullet	57	4	3.6	2.1	0.067	0.4
Paralichthys spp. Flounder	20	5	4.6	2.0	0.055	0.3
Chilomycterus spp. Porcupinefish	1	1	0.9	0.3	0.01	0.06
Ud Bone				307.2		
TOTAL	2914	110		1322.03	17.6993	

TABLE 5

SANTA ELENA: SUMMARY OF SPECIES LIST

	MNI		BIOMASS	
	#	%	kg	%
Domestic Animals	16	14.6	1.835	41.1
Wild Terrestrial Animals	10	9.1	0.626	14.0
Wild Birds	13	11.8	0.106	2.4
Aquatic Reptiles	4	3.6	0.157	3.5
Snakes	3	2.7	0.003	0.07
Fish and Sharks	60	54.6	1.734	38.8
Commensal Species	4	3.6	0.006	0.1
TOTAL	110		4.467	

TABLE 6

SANTA ELENA: BONE MODIFICATIONS

	Burned	Cut	Sawed	R. Gnawed	Hacked	Total
Ud Mammal	49	6	1	1	44	101
Artiodactyl					2	2
Deer	1					1
Pig	1	1			1	3
Cow		1				1
Ud Bird	6	3				9
Canada goose		1				1
Chicken		2				2
Ud Turtle	28				1	29
Gopher tortoise	1					1
Ud Fish	3					3
Sea catfish	4					4
Hardhead catfish	2					2
Gafftopsail catfish	2					2
Sheepshead	1					1
Black drum	4					4
TOTAL	102	14	1	1	48	166

TABLE 7

SANTA ELENA: ELEMENT DISTRIBUTION

	H	FQ	F	HQ	O	Total
Artiodactyl	1		3	2	1	7
Pig	10	1	7	4		22
Deer	4		2	1		7
Cow	1			1		2
TOTAL	16	1	12	8	1	38

TABLE 8

SANTA ELENA: MEASUREMENTS

Gallus gallus	Scapula	Dic	11.2mm
	Coracoid	BF	11.5mm
		Bb	16.7mm
	Humerus	Bd	14.6mm
			15.8mm
		Bp	19.3mm
	Ulna	Dip	13.6mm
		Bp	8.4mm
	Carpometacarpus	Bp	11.2mm
			11.2mm
			12.5mm
			11.1mm
		Did	7.8mm
			6.1mm
			7.5mm
			6.1mm
		GL	40.1mm
			39.4mm
	Femur	Bd	15.5mm
			15.0mm
		Dd	12.3mm
			12.2mm
Archosargus probatocephalus	Atlas		2.3mm
			5.2mm
			3.5mm
Cynoscion spp.	Atlas		5.2mm
Pogonias cromis	Atlas		3.1mm
Mugil spp.	Atlas		4.0mm

APPENDIX A

SANTA ELENA: SAMPLES EXAMINED

	1/8"	1/4"	Heavy Fraction
146A	x		(238, 242)
146B	x		(240, 243, 246)
147	x		
148	x	x	
149		x	
172	x		
172A	x		(251, 252)
172B	x		
173	x		
197			x
198	x	x	
202		x	
202B		x	
203		x	
217		x	x
220		x	
222		x	
223		x	
224		x	
225		x	
226		x	
227		x	
228		x	
229		x	
237		x	
238			x
239		x	
240			x
241A		x	
241B		x	
242			x
243			x
246			x
251			x
252			x

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APPENDIX XII

ANALYSIS OF THE FLORAL REMAINS FROM THE 1983 FORT SAN FELIPE (38BU162G) EXCAVATIONS

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May, 1983
Tallahassee, Florida

In the past few years, our knowledge of early colonial efforts in North America has grown as a result of archaeological research focused on the sixteenth-century Spanish settlements at Santa Elena and St. Augustine (Deagan 1979, 1980, 1981; South 1980, 1982, 1983). These projects have produced much information about daily life in the Spanish colonies. As part of the research, faunal and floral remains have been collected and analyzed to obtain information about subsistence practices in the two settlements. The results of these analyses have been presented in a series of papers (Cutler 1980; Gardner 1980, 1982; Reitz 1979, 1980a, 1980b, 1982, 1983; Scarry 1981, 1983a, 1983b, 1984) and have been integrated into one comprehensive subsistence report (Reitz and Scarry 1982). The accumulated data make it possible to draw a general picture of the colonists' subsistence adaptation and to begin to examine variability within that adaptation. Until now, however, all subsistence remains have been collected from domestic contexts. The data from Stanley South's 1983 excavations at Fort San Felipe, Santa Elena, present the first opportunity to look at subsistence behavior in a military context. They not only add to our knowledge about general subsistence behavior, but can also be used to make initial comparisons between domestic and military subsistence patterns. In this report I discuss only the floral remains. The complementary faunal data have been analyzed by Elizabeth Reitz.

Background

In 1566, Santa Elena was founded as part of Spain's efforts to claim the territory called "La Florida." Though established after St. Augustine, Santa Elena was designated the capital because of its more hospitable location (Arnade 1959). Unfortunately, the native population was less tractable. In 1576, the settlement was temporarily abandoned after an Indian revolt. It was reoccupied the next year only to be permanently abandoned in 1587 after Sir Francis Drake's raid compelled the Spaniards to consolidate their holdings (Bushnell 1981). Throughout its short life, uncertain relations with the Indians and the threat of attack by French or English corsairs required that the town be protected; Santa Elena was defended by three forts in its 21 years of existence.

Although both Santa Elena and St. Augustine were established for military and political purposes, the settlements were supposed to be self-sufficient (Lyon 1977). Initially, the settlers attempted to replicate their traditional subsistence strategies. These efforts were largely unsuccessful because many Old World crops were unsuited to the new environment. The colonists, of necessity, changed their subsistence practices. While the goal of economic independence was never fully achieved, the settlers did devise a system that allowed them to survive.

The colonists' new subsistence economy included domesticated plants from both hemispheres and locally abundant wild plants. The staple plant foods in their diet were the indigenous cultigens--corn, beans, and squash. These were supplemented by exotic New World and Old World cultigens that could be grown locally from imported seed stock. Nuts, fruits and possibly greens were gathered from the forests and fields around the settlements. Some foodstuffs were imported from Spain and from Spanish colonies in Cuba and Mexico. The unreliability of shipments, however, prohibited the colonists from depending on such supplies for their daily sustenance. Provisions, acquired from the local aboriginal populations, did more to alleviate crop shortages than did the sporadic food shipments (Reitz and Scarry 1982).

The picture I have presented is based on a combination of documentary and archaeological evidence. The pattern seems to hold for both Santa Elena and St. Augustine. However, it lacks detail and does not address the differences that might be expected between functional or socio-economic contexts. Given the consistency of this pattern in the plant assemblages analyzed to date, I believe we have reached the point that we can begin to explore the variability within the general pattern. The San Felipe data, drawn as they are from a military context, provide a starting point for this exercise.

Data Base

The plant remains that provide the data for my report were collected during the 1983 field season at Santa Elena. The excavations, directed by Stanley South, focused on the location of Fort San Felipe (1572-1576). Funds for the project were provided by a grant from the National Science Foundation.

The ability to interpret archaeobotanical materials is affected by both the preservation conditions at a site and the techniques employed to recover plant remains. Before I discuss the Santa Elena samples, a brief review of these topics is in order.

Not all plant foods utilized at a site will be preserved, nor will they necessarily be preserved in proportion to the intensity of their exploitation. Many plant foods (e.g., berries, grains, greens) are consumed in entirety and will be preserved only by accident. Others have inedible portions (e.g., nutshells, fruit pits, corn cobs) that must be discarded. Samples of archaeological plant remains are generally biased toward foods that produce inedible by-products. The situation is further

complicated in that plants are normally preserved only if they are carbonized by exposure to fire. Here again bias is introduced. Large, dense plant parts are apt to carbonize when subjected to heat. Fragile parts often turn to ash leaving no recognizable residue. Occasionally, plants will be preserved without being carbonized. This can occur in either extremely arid or wet conditions where natural decomposition is prevented. Under such circumstances, small, fragile plant parts have more equitable chances of preservation. Samples collected from such conditions are, however, still biased toward food by-products.

Recovery techniques present another set of problems for plant analyses. Most plant remains will pass through the 1/4-inch screens commonly used for artifact recovery; many will also pass through a 1/8-inch mesh. Samples collected from such screens are inherently biased toward large remains. Collection of fine screen or flotation samples provides better data for plant analyses. However, such samples must be collected consistently if they are to provide an adequate data base.

At Santa Elena we know that both carbonized and water-logged plant materials have been preserved. Carbonized remains have been recovered from a variety of contexts within both the town and Fort San Felipe. The burning of the fort when it was abandoned seems to have contributed to the preservation of plant foods. Water-logged remains were recovered from a barrel well excavated in 1981 (South 1982). Three wells were discovered within the confines of the fort. However, excavation of these wells was halted at a depth of three feet, and will be completed in 1984. There is an excellent chance that when excavation is resumed water-logged plant remains will be recovered.

The Fort San Felipe plant remains were recovered from both flotation and screen samples. Flotation was the more important technique from the standpoint of collecting an unbiased sample. Float samples were processed using a SMAP type flotation machine (Watson 1976). In brief, the flotation technique uses water to separate light materials (plant parts, fish scales) from soil and other materials that have a specific gravity greater than water. For comparative purposes, a record is kept of the volume of each soil sample processed by flotation. Additional plant remains were collected using a screen with 1/8-inch mesh. The value of these samples is more limited because of the potential for size bias.

The plant remains I analyzed were collected from features within Fort San Felipe. Samples were taken from three wells, three postholes, and from a concentration of corncobs associated with a posthole. (Appendix A lists the provenience and recovery method for the samples included in my analyses.) Feature 146 was a well located at the southwest corner of the casa fuerte. The deposits in this well suggested it had been abandoned and intentionally filled while the fort was in use. Two episodes of fill were noted in the field: a brown humic stratum containing fired daub and charcoal (146a) and a second, larger deposit of oystershell midden (146b). I treated the plant data from these strata as separate analytical units. A second well (Feature 172) was located at the southwest corner of the casa fuerte. This well has been interpreted as the replacement for Feature 146. I combined all samples from this well into one analytical unit. The third well, located at the northwest corner of the casa fuerte, was designated

Feature 217. I analyzed the samples from this feature as a unit. All three wells were represented by both flotation and screen samples. Plant remains were also collected from Features 148, 173, and 198; Feature 148 was located inside the casa fuerte, the other two were in its ditch. These postholes are parts of multiple features exhibiting evidence of rebuilding. The fill appears to be midden thrown into the holes when the posts were reset. These features were represented only by screen samples. The final feature I analyzed was a corncob concentration (Feature 197) found in association with Feature 198. The material from this feature was floated.

My analysis followed standard archaeobotanical procedures. I weighed the samples, sifted them through a set of geological screens, then sorted them under a binocular microscope. I sorted all remains larger than 1.4 mm. Fragments smaller than 1.4 mm, I scanned for small seeds but did not otherwise sort. I identified the materials using several seed identification manuals (e.g., Martin and Barkley 1961; Delorit 1970) and by reference to my comparative collection. I weighed wood charcoal but did not further analyze it. The non-wood remains in the samples I quantified by count. These counts represent the number of fragments in a category; they do not necessarily represent the number of whole seeds or nuts in that class. The small number of samples collected from Fort San Felipe precluded statistical manipulation of the data.

Results

The samples all contained carbonized plant food remains and wood charcoal. My report discusses only subsistence or potential subsistence remains. I separated the wood charcoal from the other plant materials but did not analyze it. Table 1 lists the identified taxa, their common names, and the count for each taxa. Table 2 tabulates the remains by context and sample type.

The floral assemblage lacks diversity. While I identified 17 taxa, two taxa, corn and hickory, contain by far the majority of the remains. When the various contexts are compared, it can be seen that their assemblages are similar. Interestingly, two of the samples, Features 148 and 217, contain sizeable quantities of corn kernels and beans. These represent unconsumed foods rather than food byproducts. Their presence may be a result of a cooking accident or they may be the remains of provisions that burned when the fort was fired.

The food remains include both domesticated and wild plants. I have divided the domesticated plants into two categories. Indigenous cultigens are plants grown by the local aboriginal population before Spanish contact. Old World cultigens are plants domesticated in the Old World and introduced to the New World by the Spaniards. In previous analyses (Scarry 1981, 1983b), I have defined a third category of cultigens, Exotic New World cultigens. These are plants the Spaniards encountered in other New World colonies and introduced to St. Augustine and Santa Elena. No representatives of this category were identified in the San Felipe samples. The nondomesticated plants can be divided into three groups: 1) nuts; 2) fruits; and 3) commensal plants.

The indigenous cultigens in the samples are corn (Zea mays), beans (Phaseolus vulgaris), and squash (Cucurbita sp.). These cultigens were also grown widely elsewhere in North and South America and to a lesser extent on the Caribbean Islands. The Spanish colonists could have acquired the seed stock and knowledge necessary for raising them from either the local native population or from other New World colonies.

Archaeological and historical data indicate corn was a mainstay in the colonists' diet. Corn cupules and kernels were recovered from all contexts. A few cobs and cob fragments were recovered from Feature 198.

Although corn was grown by the aboriginal and Spanish populations on the Atlantic Coast, it was also shipped to the colonies from Cuba and the Yucatan Peninsula of Mexico. Thus, the corn remains in the samples could be from either local or imported grain. Fortunately, the indigenous Eastern Flint corn can be distinguished from Cuban and Mexican varieties by kernel and cob characteristics.

The majority of the corn previously recovered from both Santa Elena and St. Augustine is Eastern Flint corn. Hugh Cutler (1980) examined a sample of 12 cobs from Santa Elena. He identified one specimen as Conico Elote, a Mexican variety; the remainder were Eastern Flint. I compared the characteristics of the corn in samples I have examined from the two settlements to those of the major corn varieties grown in the precontact Southeast, Cuba, and the Yucatan. I also compared it to the Mexican variety identified by Cutler and to corn recovered from the prehistoric sites in Georgia and Florida (Scarry 1983b). I found that the corn remains from both Santa Elena and St. Augustine are more similar to Eastern Flint corn than they are to the Cuban or Mexican varieties.

The characteristics of the corn in the samples from Fort San Felipe are compared to those of the corn previously recovered from Santa Elena and St. Augustine in Table 3. It can be seen from this that the sample means are quite similar. It follows that the San Felipe corn is also Eastern Flint. It is possible that the archaeological corn was a hybrid between Eastern Flint and a non-local variety. However, the size and condition of the samples preclude adequate investigation of this possibility.

The other indigenous cultigens were beans and squash. While both were grown throughout the Spanish territories, distinguishing varieties of these plants is more difficult than is the case for corn. The archaeological samples are too small for such purposes. Although it seems most likely that these cultigens were grown locally from indigenous seed stock, the possibility they were either imported or grown from imported seed stock cannot be eliminated.

Three of the plants identified have been classified as Old World cultigens. These are canteloupe (Cucumis melo), hazelnut (Corylus sp.), and olive (Olea europa). Both canteloupe and hazelnut have been identified from other sixteenth-century contexts: canteloupe from Santa Elena (Gardner 1982) and hazelnut from St. Augustine (Scarry 1981). While olives have been identified from seventeenth-century contexts at St. Augustine (Scarry 1984), this is the first time they have been recovered in sixteenth-century contexts.

The canteloupe seeds probably represent locally produced fruit. Melons are poor candidates for lengthy sea voyages; if shipped, they would be unlikely to have arrived in edible condition. On the other hand, they are suited to the growing conditions found at Santa Elena. Given these considerations, there seems little doubt that they were grown locally, though the seed stock must originally have been imported.

The recovery of olive pits from Fort San Felipe is both exciting and perplexing. Not only were olives recovered for the first time from sixteenth-century contexts, but they were recovered from two distinct features (Features 172 and 217). Olives require very specific growing conditions; they cannot be raised on the Atlantic Coast of North America. The pits must be from imported olives. Since olive pits are a food byproduct, the relative scarcity of olive remains in sixteenth-century samples probably indicates that olives were not generally available in the colonies. I have argued elsewhere (Reitz and Scarry 1982) that imported plant foods, which were desired because they were part of the Spaniards' traditional cuisine but not required for survival, were probably primarily available to higher status individuals. Olives fall into this category of "luxury" foods. Following this line of reasoning, the recovery of olives from a military context rather than from a high status household is somewhat problematical. I will offer several possible solutions to this dilemma in the discussion section of this report.

Though I have classified the hazelnut remains with the Old World cultigens, they may belong with the wild resources. The problem is there are both Old and New World species of hazelnut. The few nutshell fragments recovered from San Felipe cannot be identified to species. My rationale for listing the hazelnuts as Old World cultigens draws on two lines of evidence. First, though Santa Elena is within the range of one native hazelnut species (Corylus americana), it is on the fringe of that range. I would not expect the wild species to be sufficiently abundant for the nuts to be exploited. Second, we have ship manifests that list hazelnuts as part of the cargo (A.G.I. Patronato Real No. 19, Ramo 15). Together these factors suggest the nut remains are more apt to be the Old World cultigen (Corylus avellana). If I am right about their origin, then, like olives, I would expect access to such nuts to be status dependent. Their presence within the fort is similarly perplexing.

The plant remains from wild resources include nuts, fruit seeds, and seeds from two commensal families. Nuts and fruits were probably food resources. The commensal seeds might reflect exploited foods, but it is just as likely they result from the incidental inclusion in the midden of seeds from vegetation growing on the site.

I identified shells from hickory nuts (Carya sp.), acorns (Quercus sp.), and walnuts (Juglans nigra) in the San Felipe samples. Hickory nuts were by far the most abundant of the nut remains. While this may be partially a product of preservation and recovery bias, it probably also reflects their importance relative to other nut taxa. The nuts could have been shelled and consumed or their oil could have been extracted and utilized for cooking. Acorns were less abundant than hickory nuts but were recovered from all features except 197 and 198. The smaller quantities of acorns may be a result of the greater labor required to prepare the nuts

for consumption; many species must have their tannin leached before they can be eaten. On the other hand, the difference may be because acorns are primarily a source of carbohydrates. As such they duplicate the nutrition available from corn. Only a single fragment of walnut shell was recovered. This is not surprising. In contrast to hickories and oaks, which occur in groves, walnuts tend to be solitary trees. Thus, it is more difficult to gather large quantities of their nuts. It is likely walnuts were gathered when encountered but not actively sought. All three nut types were exploited by the aboriginal populations. The Spaniards could have followed the natives example in exploiting nuts or they may have acquired nuts through trade or tribute.

The seeds from five different wild fruits were recovered from Fort San Felipe. Four of the fruits are edible. These are persimmon (Diospycos virginiana), plum/cherry (Prunus sp.), rose (Rosa sp.), and grape (Vitis sp.). All are successional plants that flourish in disturbed habitats. The presence of old Indian fields and the settlers' activities may have increased the availability of these fruits near Santa Elena. The fifth fruit seed identified is wax myrtle (Myrica sp.). The waxy berries of this plant are inedible but they can be used to make aromatic candles. Wax myrtles favor wet habitats and were probably available in the vicinity of the settlement.

Seeds from commensal plant or weeds were scarce in the samples. Only two plant families were represented. The knotweed family (Polygonaceae) was represented by seeds from the genus Polygonum as well as by seed fragments that could only be identified to the family level. Many members of the knotweed family produce edible greens and seeds. It is possible that these resources were gathered and utilized. However, the family flourishes in wet and disturbed habitats. The presence of the seeds may simply be an indication of the vegetation growing on or near the site. Four seeds belonging to the grass family (Poaceae) were recovered. None were members of the domesticated genera of this family. The presence of these seeds is probably a result of their incidental inclusion in trash dumps or fires rather than their use as food.

Discussion

The plant food data from the Fort San Felipe excavations add to our understanding of subsistence practices in sixteenth-century Spanish Florida. Combined with other archaeological and historical evidence they can be used to view subsistence practices from several perspectives. The data provide the first opportunity to examine dietary patterns in a military context. These patterns can be compared to patterns observed from domestic contexts at Santa Elena and St. Augustine. The San Felipe data can be combined with other plant data from Santa Elena to compare subsistence practices in that settlement to those of St. Augustine. Finally, all data from sixteenth-century contexts can be combined to examine general patterns of subsistence behavior in the two colonies.

Assuming the plant food remains recovered from Fort San Felipe are derived from meals eaten in the garrison, they should reflect subsistence behavior in a military context. We do not know, however, whether the remains represent rations provided to soldiers on duty or whether there were soldiers living within the fort. If the former was the case, then we may be seeing only part of the soldiers' diet. In the latter instance, the data are more apt to reflect most of the soldiers' food intake. Whatever the situation, we can describe a "military diet," although it must be remembered that the number of samples on which this description is based is small. The picture I present is provisional and subject to revision when further data are available.

The majority of the plant assemblage suggests the military diet lacked variety and had few frills. The staple plant foods were primarily cultigens, especially corn and beans; squash and melons were also eaten but probably less frequently or in smaller amounts. Hickory nuts were the only wild plant resource used in any quantity. It is possible the nuts served as a source of cooking oil. Wild fruits, and fruits in general, seem to have played a minor role in the diet.

It is interesting to contrast this sketch of a soldiers' diet at Fort San Felipe with the diet of soldiers and seamen aboard the Spanish fleet. The primary plant foods issued at sea were biscuit, presumably made with wheat flour; garbanzos or lentils; small quantities of unspecified green vegetables; and olive oil (A.G.S. Guerra Antigua 49, No. 305). Each diet contains a grain carbohydrate, legumes, and oil. It is tempting to speculate that at Santa Elena the standard soldiers' ration was maintained but New World resources--corn, beans, and hickory oil--were substituted when the Old World staples were unavailable.

If the picture I have drawn bears any resemblance to the actual situation, then the presence in the samples of olive pits and hazelnut shells is incongruous. This is particularly so, if olives and hazelnuts were luxury items. There are several explanations that could account for this anomaly. It is possible the food remains are not exclusively derived from common soldiers' rations. Some officers may have occasionally taken their meals in the fort; depending on the rank of the officer, such meals might have included items not issued to the garrison at large. A second possibility is that the casa fuerte was used as a storehouse for goods not intended for distribution to the soldiers. If imported foods were being stored in the fort, the burning of the fort might have resulted in their incorporation in the midden deposits. A third possibility is that the deposits containing the olive pits and hazelnut shells date to the period immediately before the abandonment of Santa Elena in 1576. At that time, the entire population of the settlement was housed within the protective walls of the fort. If the olives and hazelnuts were eaten then, there is no way to determine the status of the individual or individuals who ate them. Finally, it is possible, though I would argue not probable, that these items were not status foods and that they were more commonly available than previous data seem to indicate.

From the standpoint of plant food consumption, the soldiers' diet appears to have been an abridged version of the general colonial diet. Table 4 compares the plant taxa identified from domestic contexts at Santa

Elena and St. Augustine to those in the San Felipe assemblage. The staple plant foods seem to have been the same in all cases, but civilians and soldiers with households in the towns seem to have utilized a greater variety of supplementary fruits and vegetables. Regardless of their origin, by far the majority of the domesticated plants could have been, and probably were, raised locally. The greater diversity of these plants in domestic contexts might be a result of each household maintaining a kitchen garden to raise produce for its own consumption. Community fields may have been planted with the dietary staples. Imported plant foods are rare in the samples. I have already discussed the puzzle presented by the olives recovered from the San Felipe wells and will not give it further consideration here. The array of wild fruits is also more varied in the samples collected from within the settlements. This could be a reflection of the presence of Indian women--wives and servants--in many of the households. Such women may well have gathered and prepared the many wild resources utilized in their traditional diet. Some wild plant foods might also have been collected and brought home by men who encountered them in the course of other activities.

Interestingly, seeds from commensal plants are also more abundant and more varied in domestic contexts than they are in the samples from Fort San Felipe. This may be more a reflection of differences in land use than of subsistence patterns. The yards and gardens of the settlements provided excellent habitats for such plants. In contrast, the area within the fort may have been thoroughly trampled by the daily activities of the soldiers. If so, it would have provided few footholds for even these hardy plants. It is even possible the interior of the fort was intentionally cleaned of stray vegetation.

Admittedly some of the differences observed between the domestic and military contexts may be a factor of the disparity in the number of samples analyzed. However, not all the variability can be attributed to bias. We will be in a better position to evaluate this question when more samples from the fort have been collected and analyzed.

Thus far, I have presented the Fort San Felipe floral data as a distinct assemblage set apart from other Santa Elena and St. Augustine plant remains. In actuality, the San Felipe plant remains are a subset of the subsistence data collected from sixteenth-century contexts at the two settlements. They can be combined with the rest of the plant assemblage from Santa Elena and then compared to the St. Augustine data. They can also be considered within the framework of the total sixteenth-century plant assemblage to see how they add to our knowledge about the general Spanish subsistence pattern.

Comparison of the total plant assemblages from Santa Elena and St. Augustine reveals more similarities than differences (Table 4). The data suggest that the colonists in both communities exploited quite similar sets of domesticated and wild plant resources. Given the settlers' common background, the resources available to them, the similar environmental conditions, and the ties between the communities, this is not particularly surprising.

There is one area in which the assemblages may differ. The data are tenuous, but they seem to indicate the colonists at Santa Elena had greater access to imported foodstuffs. The St. Augustine samples have not produced any solid evidence of plant foods that could not be raised locally. Several possible imports have been tentatively identified but in all cases the remains are too fragmentary to permit positive identification. On the other hand, olive pits, wheat grains, and hazelnut shells have been recovered from Santa Elena. Of these three plants, the first had to be imported and the other two almost certainly were. Given Santa Elena's status as capital of Spanish Florida and home of the territory's governor, it would seem logical that the settlement had greater access to luxury foods. However, the data in support of my argument are very limited. For now, this proposition lies more in the realm of speculation than interpretation.

When the total sixteenth-century plant assemblage is considered, it can be seen that the San Felipe data do more to reinforce the picture presented by earlier data than they do to alter it. The recovery of olive pits is exciting but other than the context it is not unexpected. We knew from ship manifests (A.G.I. Patronato real No. 19, Ramo 15) that olives were being sent to the colonies. The bulk of the evidence still suggests that, while foods such as wheat and olives were cherished when available, the colonists' survival depended on plant foods that could be obtained locally. This does not imply the settlers' agricultural endeavors were sufficient to meet all their needs. The Spaniards remained dependent to some extent on supplies from the Caribbean and the Old World. However, they seem to have relied to a far greater extent on trade with the Indians for provisions to augment their food supplies.

Conclusions

I have attempted to place the Fort San Felipe plant data in perspective by showing how they fit into the subsistence patterns we have observed in the sixteenth-century data from Santa Elena and St. Augustine. The picture I have presented is one of broad similarities in plant food consumption. However, within this general pattern the possibility exists that status, ethnic affiliation, and function may have produced variations on the basic theme. Overall where plants are concerned, the dietary mainstays were locally available cultivated plants. These staple foods were supplemented by collection of wild resources, particularly nuts and fruits, and by occasional use of imported foods. The soldiers' plant food consumption fits this pattern; it appears to be a pared down version of the general diet. It might be described as sustaining but uninteresting. The presence of presumably luxury foods in the San Felipe samples is somewhat at odds with the picture presented and is difficult to explain given the available data.

In closing I would reiterate that the floral data base is still small and that sample bias may be distorting what we see. This is more a problem for the finer grained comparisons than it is for the interpretation of the general pattern. It is my contention that we have reached the point where the broad picture I have drawn is a reasonably accurate portrayal of

Spanish subsistence behavior where plant resources are concerned. What we need now is increased redundancy in the data so that we can begin to examine with some degree of assurance variations within the basic pattern.

TABLE 1

PLANT TAXA IDENTIFIED FROM THE FORT SAN FELIPE SAMPLES

Taxa	Common Name	Total Count
CULTIGENS		
Indigenous		
Cucurbita sp. seed	squash	4
Cucurbit rind	squash	2
Phaseolus vulgaris	common bean	66
Zea mays kernel	corn kernel	221
cupule	corn cupule	2975
cobs	corn cobs	10
Old World		
Corylus avellana	hazelnut	3
Cucumis melo	canteloupe	13
Olea europa	olive	11
WILD RESOURCES		
Nuts		
Carya sp. shell	hickory nut	324
Juglans nigra	walnut	1
Quercus sp. shell	acorn	38
meat	acorn nutmeat	3
Fruits		
Diospyros virginiana	persimmon	11
Myrica sp.	wax myrtle	2
Prunus sp.	plum/cherry	1
Rosa sp.	rose	1
Vitis sp.	grape	1
Commensal plants		
Polygonum sp.	knotweed	2
Poaceae	grass family	4
Polygonaceae	Knotweed family	9

TABLE 2

DISTRIBUTION OF PLANT FOODS BY CONTEXT

Taxa	38BU162G	Feature 146		Well
	146a flot	146a 1/8	146b flot	146b 1/8
CULTIGENS				
Indigenous				
Cucurbita sp. seed				
Cucurbit rind				
Phaseolus vulgaris				
Zea mays kernel	3			2
cupule	13		7	
cobs	8		6	
Old World				
Corylus avellana				
Cucumis melo				
Olea europa				
WILD RESOURCES				
Nuts				
Carya sp. shell				
Juglans nigra	12	12	3	66
Quercus sp. shell				
meat			1	
Fruits				
Diospyros virginiana				
Myrica sp.				
Prunus sp.			2	
Rosa sp.				
Vitis sp.				
Commensal plants			1	
Polygonum sp.				
Poaceae	2			
Polygonaceae	1		1	
Unidentified round				
Unidentified				
Unidentifiable	7		15	
	2			
Other				
Bud				
Fruit fragment	1			
Gall				
Peduncle	3			
			1	

TABLE 2 (Cont.)

Taxa	38BU162G 172 flot	Well 172 1/8	Well 217 flot	Features 217 1/8
CULTIGENS				
Indigenous				
Cucurbita sp. seed			4	
Cucurbit rind				
Phaseolus vulgaris				
Zea mays kernel	7	31	81	18
cupule	12	12	2	
cobs				1
Old World				
Corylus avellana	1	1		
Cucumis melo			13	
Olea europa	2	5	4	
WILD RESOURCES				
Nuts				
Carya sp. shell	21	119	10	2
Juglans nigra			1	
Quercus sp. shell	5	6	10	1
meat			1	
Fruits				
Diospyros virginiana		10		
Myrica sp.				
Prunus sp.		1		
Rosa sp.	1			
Vitis sp.				
Commensal plants				
Polygonum sp.				
Poaceae		2		
Polygonaceae			9	
Unidentified round		12		
Unidentified	4		24	
Unidentifiable		10	3	
Other				
Bud				
Fruit fragment				5
Gall		1		
Peduncle				

TABLE 2 (Cont.)

Taxa	38BU162G 148 1/8	173 1/8	Postholes 197 flot	198 1/8
CULTIGENS				
Indigenous				
Cucurbita sp. seed				
Cucurbit rind				
Phaseolus vulgaris	63			
Zea mays kernel	54	5	5	
cupule	10		2924	1
cobs			9	
Old World				
Corylus avellana		1		
Cucumis melo				
Olea europa				
WILD RESOURCES				
Nuts				
Carya sp. shell	50	28		1
Juglans nigra				
Quercus sp. shell	13	2		
meat	2			
Fruits				
Diospyros virginiana		1		
Myrica sp.				
Prunus sp.				
Rosa sp.				
Vitis sp.				
Commensal plants				
Polygonum sp.				
Poaceae				
Polygonaceae				
Unidentified round	2	4		
Unidentified	3			1
Unidentifiable	14	3		
Other				
Bud				
Fruit fragment	10			
Gall				
Peduncle				

TABLE 3

COMPARISON OF CORN RECOVERED FROM SIXTEENTH CENTURY CONTEXTS AT FORT SAN FELIPE, SANTA ELENA, AND ST. AUGUSTINE

	Row #	Cupule Width mm	Cupule Height mm	Cupule w/h	Kernel Width mm	Kernel Height mm
St. Augustine	8-10	6.9	2.8	2.5	8.6	6.4
Santa Elena						
Area A Fea. 156	8-10	7.2	3.3	2.2	-	-
Area C Fea. 95	8-10	6.7	2.1	3.2	-	-
Area D. All Fea.	-	6.6	1.8	3.7	-	-
Ft. San Felipe						
Area G All Fea.	8-10	7.1	2.6	2.7	8.6	6.4

TABLE 4

PLANT TAXA IDENTIFIED FROM FORT SAN FELIPE, SANTA ELENA, AND ST. AUGUSTINE

Taxa	Ft. San Felipe	Santa Elena	St. Augustine
Indigenous			
Cucurbita pepo (squash)			X
Cucurbita sp (squash)	X	X	X
Cucurbit rind (squash)	X		X
peduncle			X
Lagenaria vulgaris (gourd)		X	
rind		X	
Phaseolus vulgaris (common bean)	X	X	X
Zea mays Kernel (corn)	X	X	X
cupule	X	X	X
cobs	X	X	X
Exotic New World			
Capsicum sp. (pepper)		X	X
Cucurbita moschata (squash)			X
Phaseolus lunatus (lima bean)			X
Old World			
Citrullus vulgaris (watermelon)		X	X
Corylus avellana (hazelnut)	X		X*
Cucumis melo (canteloupe)	X	X	
Ficus carica seed (fig)			X
floret			X
Olea europa (olive)	X		
Piper nigrum (black pepper)			X*
Pisum sativum (common pea)		X	X
Prunus persica (peach)		X	X
Triticum sp. (wheat)		X	
Apiaceae (carrot family)			X*

*Denotes tentative identification

TABLE 4 (Cont.)

Taxa	Ft. San Felipe	Santa Elena	St. Augustine
Nuts			
Carya sp. (hickory nut)	X	X	X
Juglans nigra (walnut)	X		
Quercus sp. (acorn)	X	X	X
Fruits			
Celtis sp. (hackberry)			X
Diospyros virginiana (persimmon)	X	X	X
Myrica sp. (wax myrtle)	X		
Passiflora incarnata (maypop)		X	X
Prunus spp. (plum/cherry)	X	X	X
Rosa sp. (rose)	X	X	
Rubus sp. (blackberry)			X
Serenoa repens (saw palmetto)			X
Vaccinium sp. (blueberry)			X
Vitis sp. (grape)	X*		X
Wetland plants			
Carex sp. (sedge)		X	
Cyperus sp. (flatsedge)		X	
Gleditsia aquatica (water locust)		X	
Commensal plants			
Amaranthus sp. (pigweed)			X
Chenopodium sp. (goosefoot)		X	X
Eleusine indica (goose grass)			X
Euphorbia dentata (spurge)			X
Galium sp. (bedstraw)		X	
Ipomoea sp. (morning glory)		X	
Lonicera sp. (honey suckle)			X
Oxalis sp. (wood sorrel)		X	
Polygonum sp. (knotweed)	X	X	X
Portulacca oleracea (purslane)			X
Sida sp. (sida)			X
Smilax sp. (greenbrier)		X	X
Solanum sp. (nightshade)			X
Strophostyles umbellata (wild bean)		X	
Xanthium sp. (cocklebur)			X
Compositae (composite family)			X
Fabaceae (legume family)		X	X
Poaceae (grass family)	X		X
Polygonaceae (Knotweed family)	X		X
Solanaceae (nightshade family)			X

*Denotes tentative identification

APPENDIX A

FLORAL SAMPLES ANALYZED FROM FORT SAN FELIPE 38BU162G

Feature	FS	1/8" mesh sample	Flotation sample (liters)
146a	238		8.0
146a	242		8.0
146a		X	
146b	240		8.0
146b	243		8.0
146b	246		8.0
146b		X	
172a	251		8.0
172a	252		8.0
172a		X (2)	
172b		X (2)	
172		X	
217			8.0
217		X	
148		X	
173		X	
197			5.0
198		X	

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APPENDIX XIII

TABULATION OF FIRED CLAY DAUB BY SQUARES IN FORT SAN FELIPE

3' Square Number	Grams of Fired Clay Daub	10' Square Number	Grams of Fired Clay Daub
2	2.40	38	11.20
3	22.60	39	2.30
4	1.50	40	22.50
5	26.60	41	8.80
6	0.0	42	16.50
7	1.40	43	5.00
11	4.30	44	6.10
12	22.00	45	0.0
13	0.0	46	162.00
14	5.50	47	58.00
15	0.0	48	116.20
16	13.50	49	54.00
20	0.0	50	70.80
21	0.0	51	223.20
22	0.0	52	87.50
23	0.0	53	204.30
24	0.0	54	35.00
25	0.0	55	19.20
29	15.20	56	4.00
30	127.50	57	7.50
31	0.0	58	90.50
33	20.00	59	340.00
34	0.0	60	81.00
35	14.50	61	14.50
		62	56.00
		63	147.70
		64	18.60
		65	84.60
		66	142.60
		67	103.50
		69	24.10
		70	125.00
		71	903.50
		72	170.00
		73	36.00

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